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MAJOR STREET SYSTEM

FOR THE

CITY OF HAMILTON

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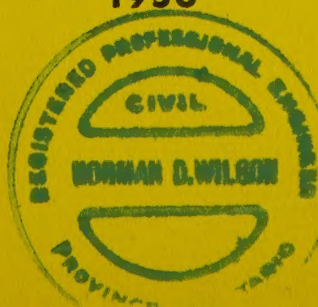
NORMAN D. WILSON and A. E. K. BUNNELL

to the

City Planning Board of Hamilton

November

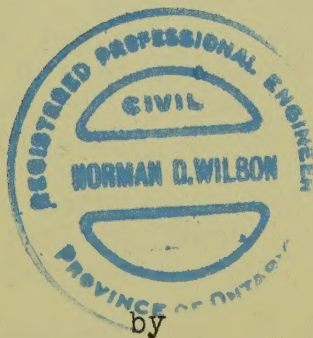
1950



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REPORT
to
The City Planning Board
of the
CITY OF HAMILTON

ON A
MAJOR STREET SYSTEM
FOR THE
CITY OF HAMILTON



by
NORMAN D. WILSON
and
A. E. K. BUNNELL

NOVEMBER
1950

REPORT

THE CITY ENGINEERING BOARD

OF THE

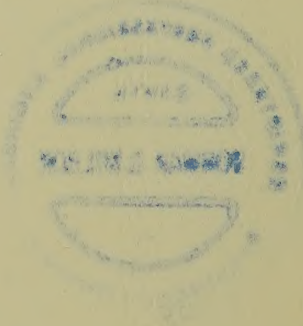
CITY OF BOSTON

ON A

MAGNET SYSTEM

FOR THE

CITY OF BOSTON



REPORT BY

JOHN J. BROWN

AND

WILLIAM J. BROWN

REPORT

FOR THE

CITY

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Toronto, November 30, 1950

Hugh J. Sedgwick, Esq.,
Chairman, and Members
Hamilton Planning Board,
HAMILTON, Ontario.

Report -
on a Major Street Plan
for Hamilton.

Dear Sirs:

On January 23, 1950, upon invitation extended to each of us to jointly advise the Board as to a system of major streets in Hamilton, we appeared before the Board and presented a proposal dated January 20th, to study the future street and traffic needs in Hamilton, and present recommendations for a major street system. This proposal was accepted by the Board, subject to the approval of the Board's annual budget by Council. This was approved by the Board of Control on March 7th, and by Council at its meeting following.

We immediately started a review of actual conditions on the ground, and for the next eight weeks spent three days each week, exploring the physical city and making ourselves intimately acquainted with all sections of the city, and its likely trends of expansion. By the end of that period, the generalities of the long-term solution of the problem for a city of double the present population was very distinct in our minds.

The imperative need for improved access to the mountain had occasioned the appointment early in the year of the Mountain Access Committee -- a very strong committee, charged with the responsibility of recommending an immediate program for improved access. We met this Committee on May 25th and again on June 7th, when a trip over the existing mountain roads was made. At that date we promised to submit our report in September.

Hugh J. Sedgwick, Esq., et al.

30 Nov.'50

On September 7th at an evening meeting of the Planning Board at which the Mountain Access Committee were present, Mr. Wilson reported verbally, and illustrated with lantern slides taken from our draft plans, our conclusions and recommendations for major streets including mountain roadways.

In view of our inability to complete our formal report by the middle of October, on October 18th, we wrote to the Board a letter setting out our recommendations as to the priority of development of mountain roadways. This appears as Schedule XIV hereto. On October 24th, we met with the Planning Board, to discuss this matter of priorities, following which meeting we wrote to the Board as per copy of letter attached hereto as Schedule XV.

On November 15th, we met the Mountain Access Committee at an evening meeting, and, illustrated by slides, briefly outlined our major recommendations in general, and our conclusions regarding an immediate program as set out in the above letters.

The urgency of obtaining relief roads to the Mountain necessitated on our part, a more detailed development of recommended mountain roads than we initially anticipated. To ensure the feasibility of our proposals, the alignments and grades of our recommended roads were laid down on large scale maps (100' = 1"). The original drawings of these are filed with the City Planning Department. These plans are preliminary plans only, and are subject to amendment in detail when accurate cross-sections of the mountain face are available.

We would point out the need of proceeding with the engineering surveys of the mountain face to permit definite plans and estimates of cost of the various roads proposed to be prepared. This will provide another element on which to determine priority of construction, when from time to time the occasion comes around (generally on very short notice) when decision must be made to proceed with the next sequence of mountain roads. While the cost of these surveys,

Hugh J. Sedgwick, Esq. et al.

30 Nov.'50

plans and estimates will represent a substantial sum, no proposal can be gone on with, until these are available. Nor will the mountain face alter at such a rate, as to affect these plans if, when made, they were not actually required for ten or fifteen years.

We would stress that our report submitted herewith is a City Planning Report, and not a Traffic Report. The Report deals with the city as we visualize it with double its present population and fully four times present motor vehicle traffic. We have made certain suggestions as to early priorities, but the actual priority of the various works proposed will be determined by actual needs as they arise. The main need confronting the City, is to maintain existing opportunities to consummate the street plan as presented herewith, until such is finally effected.

It is for this reason that we believe our assignment would not be complete in merely recommending the physical system of streets to meet the demands of a larger Hamilton, and of increasing highway traffic. We have given at some length our recommendations as to how a substantial part of the cost should reasonably be met. As well we have outlined the existing legal powers of the City, and what powers should desirably be obtained to protect the great opportunities that presently exist for the street and parking improvements proposed, and, we believe, with equity to the owners of lands affected.

During the years that Hamilton has been growing from a village to a city of 250,000 population, and very definitely during the period that the ownership of automobiles has risen from zero to 50,000, or 1 for each 5 persons, virtually nothing has been accomplished by way of street widenings or extensions, or even to guide the location of new streets to facilitate the movement of the traffic thus engendered.

The Civic Authorities are to be complimented for establishing a Department of City Planning. The Depart-

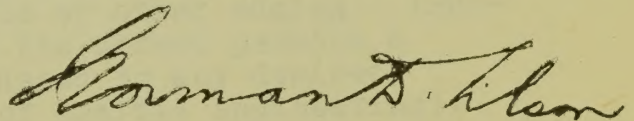
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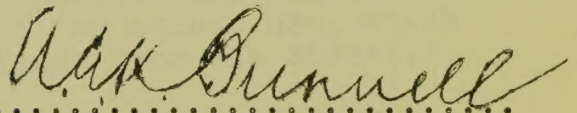
ment can, we feel sure, be trusted to see that as new streets are opened in what are now farm lands, they will be integral parts of a preconceived plan. Already much has been accomplished in that way in the outlying zones, and the benefits will be very apparent ten or fifteen years hence. But in respect of the core or centre of the city, at no time has any direction been given. No city can function without a healthy core or heart. The situation can only be corrected by the progressive construction of the improvements envisioned in this report.

We express our thanks to Mr. W. L. McFaul, City Engineer; to Mr. David Jamieson, City Planning Commissioner, and to their respective staffs, as well as to all other civic officials contacted, for providing the answers to many requisitions for information pertinent to our studies.

Yours truly,



.....
Norman D. Wilson



.....
A. E. K. Bunnell

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FOREWORD

As often grave misunderstandings occur because of differences in meaning attached to certain words under English, United States or Canadian usage, it is desirable that the sense in which certain words are used in this report should be clearly stated.

- (1) Street means the public allowance dedicated for roadway purposes to its full width between the limits of the private land on either side. (A street cannot be widened without the acquirement of private property).
- (2) Pavement or Roadway means the paved carriageway between curbs or other edging. (Provided the width of the street permits, a pavement can be widened to any desired width as a detail of traffic engineering).
- (3) Dual Roadway means two roadways separated by an unpaved strip not available for vehicle use.
- (4) Limited Access Street means that there exists between a street and adjacent private property, a strip of public land (however narrow) not dedicated for street use, which severs the private lands from the street.
- (5) Road means any path or way travelled by vehicles to the width actually travelled by or available to such vehicles.
- (6) Thoroughfare literally means "going through". It is a road that goes through to an outlet or some point of importance.

A MAJOR STREET PLAN FOR HAMILTON

DIVISION "A"

BASIC CONSIDERATIONS

SECTION 1

THE ESSENSE OF THE PROBLEM

This is a project to provide for essential traffic circulation within the City of Hamilton when it has a population within its metropolitan zone (taken as a circle of 6 miles from King and James Streets) of 350,000 to 500,000. It is believed that a population of 350,000 in the Metropolitan Area of Hamilton is likely within a period of 20 years. The population within the area is already 250,000, having increased one-third in the past 12 years.

Just when any particular population will be reached is not a matter of concern. The various stages of the plan can be scheduled to the growth in population.

No part of the County of Wentworth is more than 22 miles distant from the City Hall in Hamilton. Within this 22 mile circle are the urban municipalities of Beamsville, Grimsby, Caledonia, Burlington, Bronte and Oakville, and the City of Brantford--places long ago brought into the market area of Hamilton by radial electric railways which eminently served the City in their day and generation. Within this circle is enclosed some of the most fertile agricultural land in Canada, and a substantial part of Canadian industry.

Southern Ontario (south of the French River) has an area of closely 50,000 square miles and con-

tains 4,000,000 population. Pennsylvania contains 45,000 square miles but has a population of 10,435,000. Illinois contains 56,000 square miles and has a population of 8,700,000. There is every possibility that Southern Ontario will double its population within the lifetime of those now living, and Hamilton may well double its population within the next half century -- possibly in 40 years.

When such increase has occurred, traffic will certainly not be less than double present traffic on the streets. It will more likely be four times present traffic. While the city will have spread out to cover at least double the area with a corresponding ratio of street space, distances of travel will be longer and individual cars will spend more time in traffic. As well, there will be a greater ratio of persons and vehicles seeking the central city on business, or trying to make their way through or across it.

In 1949 there were 43,421 automobiles and 10,591 motor trucks registered in the County of Wentworth including Hamilton; of these, 32,929 automobiles and 7,328 motor trucks gave their domicile as Hamilton.

This is a ratio of 182 automobiles and 44 trucks per 1000 population in the County as a whole; 166 and 38 respectively in Hamilton, and 222 and 69 respectively in the County excluding Hamilton.

Even if these ratios should not become smaller as the population increases to double present population, traffic conditions in Hamilton will steadily deteriorate unless comprehensive measures are taken to improve present facilities to provide for the increase in street traffic that is bound to come with the continued growth of the community.

As a basis of comparison statistics of the increase in the number of vehicles (passenger cars and commercial vehicles) in the four largest cities of Ontario, are given in the statement that follows this page.

Total Motor Vehicles in Metropolitan Cities of Ontario

<u>Year</u>	<u>Hamilton & Wentworth County</u>	<u>Windsor & Essex County</u>	<u>Ottawa & Carleton County</u>	<u>Toronto & York County</u>
1939	36,163	31,130	29,291	172,815
1941	41,770	36,375	32,960	186,627
1945	36,914	32,318	28,917	164,023
1946	39,668	35,212	30,937	172,792
1947	43,461	36,792	34,573	192,069
1948	46,966	38,793	37,410	223,427
1949	54,012	43,925	41,741	246,566

Population in aforesaid Metropolitan Communities

1939	186,366	164,964	188,303	887,822
1941	194,879	173,840	197,123	927,498
1945,	211,412	187,121	210,977	974,139
1946	215,914	190,503	213,759	938,569
1947	222,318	195,769	220,350	1,035,494
1948	226,851	200,410	220,458	1,041,055
1949	239,594	206,676	222,603	1,070,522

Population per Motor Vehicle

1939	5.2	5.3	6.4	5.1
1941	4.7	4.8	6.0	4.9
1945	5.7	5.8	7.3	5.9
1946	5.4	5.4	6.9	5.8
1947	5.1	5.3	6.4	5.4
1948	4.8	5.2	5.9	4.7
1949	4.4	4.7	5.3	4.3

The ratio of population to motor vehicles in the City of Los Angeles now stands at 2.5. The ratio in Wentworth County including Hamilton is estimated as of October 1950 at 4.1. If this ratio falls to 3.0 when the population has reached 360,000, the number of motor vehicles operating will be double the present

number. If it falls to 2.5 when the population is 450,000, the number of motor vehicles will be triple the present number.

Better than many words the above indicates the size of the problem for which you have asked us to propose a solution. The question of major traffic thoroughfares is by all odds the greatest problem facing urban communities today. The difficulty is not one of engineering, but of finding ways and means to pay for a solution. We speak of our streets having been laid out in horse-and-buggy days. Actually most of the cities on this continent are a product of the electric street car. We are now in an automobile age, for which our cities were not designed. We can debar the motor vehicle entrance to our cities or their densely built-up central sections, in which case the city itself will wither away - - decentralize is the word used. We can stand pat and do nothing, in which case a blanket of street congestion will slowly stifle the business centre -- and the result will be the same.

Or we can improve the traffic facilities to fit them for regulated motor vehicle use of sufficient amount to sustain the existing business life and some reasonable expansion of same. Our recommendations herein are based on this last alternative.

SECTION 2

EARLY DEVELOPMENT OF CITY AND STREET SYSTEM

The City Site

For a long era of geological time prehistoric Lake Iroquois occupied the basin of present Lake Ontario. Its waters stood some 110 feet above the level of present Lake Ontario, and washed against the talus at the foot of the escarpment. For the same geological reasons that Burlington Beach was later thrown across the end of Lake Ontario to form Burlington Bay, a beach was formed across the end of Lake Iroquois. When the waters fell to their present level that beach became the elevated ridge now forming the Western Entrance to the City. This continues at the same level grade to the foot of the mountain at James and John Streets, (Main Street and King Street climb over it, and the T.H. & B. Ry. tunnels through it). But, Also, with the fall of Lake Iroquois to Lake Ontario level, an underwater terrace approximately two miles wide was uncovered and it was on this gently sloping terrain that Hamilton was established, and had ample room to develop to a city of 150,000 population. Constricted between the 300 foot almost vertical escarpment and the bay shore, the city extended westerly and easterly, more particularly the latter, into a narrow ribbon $7\frac{1}{2}$ miles in length. Only relatively recently has there been any need or inducement to spread south on the upper level. This is a flat plain having its general level 385 feet above Lake Ontario. For about a third of a mile from the escarpment, it falls almost imperceptibly to the south, then rises gently to the south limit of Barton Township.

The Beginning of Hamilton

In view of the great volume of historical and statistical material compiled by Town Planning Consultants Limited in 1945, it is hardly necessary to discuss in detail the history of Hamilton or the reasons for its development to its present industrial status. Only a few comments relevant to the subject of this report will be made.

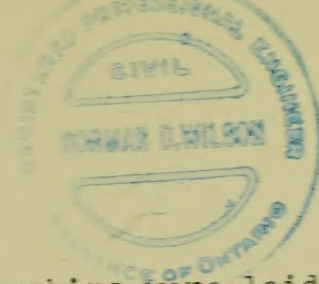
The honour of being the first settler at the head of Lake Ontario is claimed for a trader, Richard Beasley, who was the first owner of what is now Dundurn Park - a strategic situation for trade. About 1785 two Loyalists, Charles Depew and George Stewart, settled on the south shore of Burlington Bay and probably an even earlier settler was another Loyalist, Robert Land, who took up land under the mountain to the west of Stoney Creek.

From very early days an Indian trail linked Niagara and Detroit. This appears to have been a fair path as early as 1788, as we are told that in 1787 two brothers from Pennsylvania, Abraham and Isaac Horning, built a cabin near Burlington Bay and a year later were joined by two sisters and another brother with his family, who from Niagara "followed the trail to the head of the lake". In February 1793 Governor Simcoe undertook an arduous journey across the peninsula from Niagara to Detroit travelling on foot most of the way.

This trail was King Street, Tope Crescent and Main Street, and through Ancaster or Dundas. Ancaster is older than either Dundas or Hamilton, and had a school as early as 1796. Dundas had the distinction of having a log jail which was used during the war of 1812. There was no settlement at Hamilton at that date.

An early trail to the north side of the lake was across Burlington Beach. At the south end of the beach stood a government building called the King's Head Inn, or Government House, "whither the Indians came annually by hundreds to receive the presents promised to them for lands they had relinquished". This building was destroyed by the Americans in 1813.

Another trail to the north shore was across the high isthmus, now generally termed the Western Entrance. This trail connected with the Niagara-Detroit Road by what soon was called York Street. This road to the north shore and the capital was a vital highway in the war of 1812 and was protected by a battery, still existing. It is not unlikely that, prior to the town-site being laid out, and at any rate prior to the subdivision of the township, York Street carried directly into King Street.



Saltfleet and Barton Townships were laid out and surveyed in 1791, Ancaster Township in 1796. James Street is a township road allowance which by fortuitous circumstances met the shore of the bay where the ground was high and the water deep, intersected the main trail just west of where it forked, and reached the foot of the mountain at a point where it could be advantageously climbed, and where probably an Indian trail to the top already existed.

It was in 1812 after war broke out that George Hamilton with his wife and infant son moved from Queenston to the head of the lake, and it was he who a few years later laid out a townsite on his property and named the streets after members of his family -- James, John, Catharine, Hannah, Maria and Augusta*. In 1816 Wentworth became a separate county and Hamilton the County Town.

James Street was the focus of the infant settlement. It remains the business centre of the city 135 years later, and will continue to do so, even though it is the concentration of activities in the immediate vicinity of this four corners that is a major factor in the traffic problem today.

There was nothing unusual in the fact that the streets laid out by Hamilton and others for the infant settlement were narrow and frequently discontinuous across the two main streets. This also occurred in Toronto in the downtown area and more particularly in the Bloor and Yonge district in the original Village of Yorkville. In Hamilton - MacNab, Park, Bay and Caroline Streets on the west side of James Street are all narrow streets, only 45 feet or so wide where they cross King Street, as are also Hughson, Catharine, Mary, Walnut, Ferguson and Spring Streets on the east side of James Street. Only Hess and John Streets in addition to James Street are 66 feet wide where they cross King

* Early history in part from "The Counties of Ontario" by Emily P. Weaver (Bell & Cockburn, Toronto, 1903)

Settlement and Indian townships were laid out
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James Street was the focus of the infant set-
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line Streets on the west side of James Street are all
narrow streets, only at least or so wide where they
cross King Street, as are also Hughson, Catherine, Mary
Wainwright and Ewing Streets on the east side of
James Street. Only Bass and John Streets in addition
to James Street are 32 feet wide where they cross King

Street in the half mile to the west and in the half mile to the east of James Street.

Main Street is the concession road allowance and is 66 feet wide, but Jackson Street, King William Street and Rebecca Street are all narrow streets, 40 to 45 feet in width.

On the other side of the ledger, Hamilton has the magnificent assets of Gore Park, Court House Square and the Market Square as street inheritances from its founders.

Original Township Road Allowances

When Barton Township was laid out in 1791, it was surveyed into rectangular blocks of 200 acres each, contained between concession road allowances running east and west, 50 chains or $5/8$ of a mile apart, and north and south road allowances 40 chains or $1/2$ mile apart.

These concession road allowances running east and west are in sequence: Burlington Street; Barton Street; Main Street; Concession Street (Lawrence Road at the east end and Aberdeen Avenue at the west end); Fennel Avenue; Mohawk Road; Lime Ridge Road; Stone Church Road, and the road allowance between Barton and Glanford Townships now King's Highway No. 53.

The Township side lines are respectively from west to east: Paradise Road (west 30th Street on the Mountain); Dundurn Street (west 20th Street); Queen Street (Upper James Street); Wellington Street; Wentworth Street; Sherman Avenue; Gage Avenue; Ottawa Street; Kenilworth Avenue and Strathearne Avenue (the boundary line between Barton and Saltfleet Townships). Continuing into Saltfleet, which was similarly laid out at the same time, are Parkdale Avenue; Woodward Avenue; Nash Road (at East Lawn Cemetery) followed by the road allowance occupied by Highway No. 20 through Stoney Creek.

Barton Township extends westerly to Parkside Drive a quarter mile west of Paradise Road. Most of Westdale and West Hamilton were formerly part of Ancas-

ter Township. The part now included in Hamilton is rough terrain, and none of the existing streets conform with original road allowances.

Hamilton is fortunate in the frequency of the original road allowances; at any rate in comparison with Toronto, where they are spaced $1\frac{1}{4}$ miles apart in each direction. Also in the case of Hamilton both concession roads and sidelines are continuous without jogs. The only major exception is that the sidelines jog at Concession Street, but as this is right at the escarpment this is a matter of no account. Barton Street jogs almost its width at James Street.

Private Subdivisions

As the lands were patented to the settlers in accordance with the township survey, it was natural, as these rectangular farms were further subdivided for urban use, that the streets were laid out parallel to the concession lines and to the sidelines in a gridiron system. The chief exceptions came at the very beginning, when King William, Rebecca and Gore Streets were laid out parallel to the travelled main road (that became King Street), which at this point ran at a slight slant to the concession road allowance (now Main Street).

East and West Streets Relatively Few - But Highly Important

While to the west of James Street, the greater number of streets run east and west, to the east of James Street the direction of the streets is pre-eminently north and south. This is an important factor in the traffic problem of Hamilton. Almost ninety per cent of the present population reside on the lower level of the city, which also contains all the industrial and commercial life of the city. This lower terrace is at best $2\frac{1}{2}$ miles wide from the bay shore to the foot of the mountain, but the built-up area extends for $7\frac{1}{2}$ miles along it, some $2\text{-}3\frac{1}{4}$ miles to the west of James Street and $4\text{-}3\frac{1}{4}$ miles to the east of James Street. Feeding this preponderant eastern extent are only six continuous traffic routes, namely Burlington Street, Barton Street, Cannon Street, King Street, Main Street and the Stinson-Cumberland-Lawrence route. All of these routes have disabilities from railway

crossings at grade, Burlington Street and Cannon Street most severely; four are adversely affected by street car operations; King Street and Main Street cross each other; and all suffer from reduced roadway width due to car parking.

Main street is part of King's Highway No. 8, while King Street and Barton Street continue eastward as County Highways.

North and South Streets

The great majority of streets run north and south but all are stopped at either end by the waterfront and by the mountain.

Outlets to the north and northeast are limited to two, the Western Entrance and Burlington Beach. The former carries King's Highways No. 2 and No. 6, the latter the Queen Elizabeth Way and Highway No. 20. From the city side access to the first is by York Street and by Longwood Road and their respective connections, and to the second by Beach Road and its connections: Queen Street, Kenilworth Avenue, Parkdale Avenue, etc.

These two outlets are six miles apart and duplicate facilities would be a safety factor; a duplicate connection to the Guelph Road is available from Longwood Road at the Western Entrance.

Access to the Mountain

Improved access to the mountain is one of the more important immediate needs facing Hamilton. There is an increasing urban and suburban population on the Mountain Top though as yet totalling hardly more than an eighth of the total population within the metropolitan zone.

The chief disabilities of the existing roads up the Mountain are inadequate widths; excessive grades; grade crossings of railways (on Ottawa and Wentworth Streets); too great a concentration of roads feeding into John Street; conflict of traffic streams at hairpin turns and elsewhere.

In view of the immediate need of improved access to the Mountain, existing routes of access will be described at some length.

MOUNTAIN ROADWAYS

There are eight effective roads leading to and from the mountain within the city limits. Counting from the west, these are:

- (a) Becketts Drive leading westerly from the head of Queen Street and reaching the top at 20th Street. The average grade is 6% with a maximum grade of 7.5% for 600 feet on Queen Street at the foot of the hill. From the intersection of Glenfern Avenue and Queen Street to the top of the grade is 3600 feet and the rise about 215 feet.
- (b) James Street Mountain Road leading south-westerly from the head of James Street and reaching the top of the hill at West 5th Street. Return to Upper James Street route was originally made by Fennel Avenue but is now usually by Inverness Avenue. The average grade up the mountain side is a fairly uniform 10%. From 125 feet above Markland Street where the grade on James Street sharpens, the ascent to the mountain top is made in 2400 feet, the rise being about 227 feet.
- (c) Arkledun Avenue and Claremont Hill to Upper James Street. This is the present most heavily travelled route up the mountain, and is part of King's Highway No. 6. Starting from John Street the route goes easterly on Arkledun Avenue for 1100 feet, then turns westerly on a hairpin turn, and in 2400 feet ascends to the mountain top and Upper James Street. The grade on Arkledun Avenue is 6.0% and on Claremont Hill 5.5%. The maximum grade is on John Street north of Arkledun Avenue where a maximum of 10.0% is encountered. The chief disabilities are this steep grade - and the fact that the Mountain Boulevard crosses it at this very point; the use of Arkledun Avenue in common with the Jolley Cut route, and the hairpin turn at the foot of the Claremont Hill.

(d) Jolley Cut. This route starting at John Street leads easterly along Arkledun Avenue, continuing easterly from the hairpin turn to debouch through a rock cutting at Concession Street between East 12th and East 13th Streets. The distance from John Street to Concession Street is 2950 feet in which the rise is 227 feet--of which 156 feet is made in the Jolley Cut section. This route has an average grade of 7.7% and a maximum grade as high as 11.55% on the Jolley Cut section.

(e) Mountain Boulevard. This nominally starts at James Street; it crosses John Street immediately north of Arkledun Avenue, then rises gradually on grades not in excess of 3% to the line of Sherman Avenue, to an elevation about 45 feet below mountain level. From this point a rock cutting carries the road under Mountain Park Avenue and Concession Street on a rising 3% grade, to reach the surface at Crockett Street, immediately east of Sherman Avenue. This road constitutes King's Highway No. 55.

(f) Charlton Hill. From a point slightly west of the line of Wellington Street a connecting road from the Mountain Boulevard leads easterly down the hill on a 3% grade to a connection with Charlton Avenue almost midway between Victoria Avenue and Wentworth Street. This provides a connection between Victoria Avenue and Crockett Street as also a nominal connection from Wentworth Street to Crockett Street. (The grade on Wentworth Street is of the order of 15%, with 3 railway crossings at grade). The distance of travel from Wentworth Street and Cumberland Avenue to Sherman Avenue and Crockett Street is just over two miles. The rise is 306 feet. If the mountain did not intervene the distance would be just under one mile.

(g) Mountain Boulevard - East Branch. This is a continuation of the Boulevard easterly from Sherman Avenue and the rock cut from Crockett Street. This roadway descends on various grades averaging 3% to the production of the centre line of Ottawa Street to a level 70 feet above T.H. & B. rail.

Ottawa Street is reached by two hairpin turns and a grade of 7%. The tracks of both the Port Dover branch of the C.N.R. and the main lines of the T.H. & B. are crossed at grade.

- (h) Flock Road. This road descends westerly from Brow Road (Concession Street) from a point 835 feet east of Upper Ottawa Street to connect with the Mountain Boulevard at Elevation 495 or 138 feet below mountain level. The distance is 2100 feet and the average grade 6.6%. Access to Ottawa Street is provided by the Mountain Boulevard. This road is considerably travelled. Its disabilities are the grades at either end, four hairpin turns and two railway crossings, one being double-track.
- (i) Of mountain roads outside present city limits, the first to the east is the Mount Albion Road, which leaves King Street a quarter mile east of Parkdale Avenue and, rising up the east side of King's Forest Park, reaches the top of the hill at Mount Albion. The middle section of this road is outside the City Limits and constitutes County Road No. 6. This road has a relatively easy ascent until near the very top, where modifications appear possible.
- (j) The next road to the east that ascends the mountain is King's Highway No. 20 to the west of Stoney Creek.
- (k) To the west of the city is the former Horning Mountain Road, which extends from King's Highway No. 2 (the Ancaster Road) immediately north of the subway under the T.H. & B. tracks, up the hill to the Sanatorium Road, about 3/4 mile west of the Sanatorium. This is a very steep ascent and has been closed to traffic.
- (l) A similar mountain road leads up the hill from Highway No. 2, in Lot #52, but in effect the first ascent of the mountain to the west of Queen Street is Highway No. 2 through Ancaster.

SECTION 3

TRANSPORTATION AND TRANSIT--AND THEIR EFFECTS ON THE CITYEarly Transportation Problems

As has already been mentioned, Hamilton was founded at a crossroads and the original crossroads is still its business centre. Its proximity to Burlington Bay was not a direct factor in its founding. Indeed for nearly 20 years after the townsite was laid out, Burlington Bay was not open to lake shipping, other than to canoes and bateaux of the shallowest draft. But by 1832, a channel to the lake had been opened across the bar as part of the Desjardins Canal project, which was not completed to Dundas until 1837. What Dundas had so ambitiously conceived, reacted almost wholly to the benefit of Hamilton. In 1832 Hamilton had a population of only 800; by 1837 this had increased to 3500.

In 1829 the first Welland Canal was opened. It affected Hamilton but slightly except to induce emulation. "In 1834 the London and Gore Railroad Company was chartered by the Legislature to build a railway from London to Burlington Bay, but nothing was done for another fifteen years. When the charter of the company was renewed in 1845, the name was changed to the Great Western and the route altered to extend from the Niagara River via Hamilton to Windsor and Sarnia. For meanwhile the New York Central had reached Buffalo and the Michigan Central was being pushed westward from Detroit toward Chicago. A road through Canada would provide a shorter link than one south of Lake Erie and the Great Western was designed to fill this gap". *

Hamilton A Railway Centre

The Great Western did not get under way until 1851. The first section was opened from Hamilton westerly in October 1853. This was the second railway to

* Chronicles of Canada Series: The Railway Builders

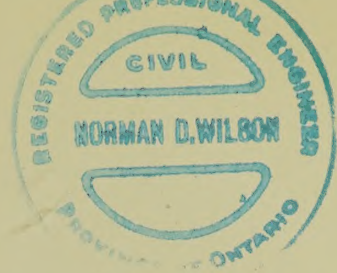
operate in Ontario, following by a few months the Northern Railway from Toronto to Barrie. In January 1854 the Great Western was completed from Suspension Bridge to Windsor.

It was as a railway centre that Hamilton developed. First the Great Western from Suspension Bridge to Windsor, then its branch to Toronto in 1865; then in the late 70's the line south to Port Dover and northward via Burlington Beach to Collingwood; next in 1895 the T.H. & B. from Welland through Hamilton and Brantford to Waterford, and providing C.P.R. connections from Toronto to Buffalo; lastly the C.P.R. line through Guelph to Goderich in 1912.

Co-incident with the opening of the T.H. & B. in 1895 there began the great industrial expansion of Hamilton. The hard times of the early 1890's disappeared in the exuberance that followed the Klondyke gold discoveries. There followed the great decade of the settlement of the Prairies and the accompanying expansive era of railway building that ended in 1914, and hardly of less importance, concurrent mining developments in Northern Ontario. These and Imperial Preferences brought Canada to new heights of prosperity and self-assurance. Hamilton found its field of opportunity in heavy industry and in cotton goods, and its industrial life grew enormously.

But because its industry is essentially of the heavier types, the great majority of plants in Hamilton are dependent on railway siding facilities. Railway crossings of streets at grade are numerous and in view of the level terrain, almost inevitable. There are at least 64 points where railway main lines or main industrial leads cross streets at grade with one or more tracks within the city limits, with at least 50 of these on main traffic streets. In addition there are at least 50 points where streets are crossed at grade by private sidings. All are the cause of street traffic delays and congestion, to say nothing of accident hazard.

This question of railway crossings is a very important factor in the consideration of a major street plan.



Area of Industrial Expansion

It is greatly to be regretted that when the T.H. & B. Railway was built in 1895, it was not located adjacent to the C.N.R. Very largely heavy industry is concentrated on the bay front north of the C.N.R. main line, with a great part north of Burlington Street. The T.H. & B. have access to this zone by the so-called 'Belt Line' track east of Gage Avenue built in 1900, but there is limited industrial opportunity along its main line.

The continued growth of Hamilton depends to a very great extent on the continued growth of industry within or adjacent to its borders. It is to be expected that the east end of the Bay extending well up toward the canal to the lake, will be filled in and developed for industry. Aside from this area, there is very considerable land available for industry adjacent to the C.N.R. main line east of Parkdale Avenue, and at Aldershot and in West Flamboro.

Also, looking ahead 10 or 15 years, it would appear that a light industrial zone should be provided for on the mountain adjacent to the C.N.R. Port Dover branch in the vicinity of Rymal Station.

Former Radial Railways

Not the least of the causes leading to the expansion of Hamilton were the now defunct Radial Railways. These brought within the orbit of Hamilton's retail trade, commercial organizations and professional persons, a great extent of prosperous countryside stretching through Grimsby to Beamsville on the south side of the lake, and through Burlington and Bronte to Oakville on the north side of the lake. To the west, Dundas has been for fifty years and more within the Hamilton business orbit, as has Ancaster. While the radials ultimately reached Brantford, this line was the latest put into service and never attained the market patronage of the other three lines. All these radial lines have been succeeded by bus operations almost local in character. Fully 200 buses, providing purely local suburban service within a range of 20 miles, are

scheduled into Hamilton on a normal day with an equivalent number outbound. In addition another 180 trips, also serving the market area but extending to points further afield, are scheduled outbound, and the same number inbound.

While the radial railways have completely disappeared they have bequeathed to Hamilton potential traffic arteries of very great value. These are:

- (1) The grade-separated entrance to the industrial area provided by the radial right-of-way adjoining Birch Avenue.
- (2) The graded extension of Lawrence Road No. 8 Highway at King's Forest Ravine, which can be readily developed into a most useful highway.
- (3) A right-of-way on which a highway with a very low grade up the mountain can be developed in the future when the need requires same--from Dundurn Street (or Queen Street) towards Ancaster.

As well, the wide street across Burlington Beach is in part an inheritance from the radial railway, as is the widened section of Burlington Street. Also, it is more than likely that the boulevard to Dundas (Highway No. 102) would not have been developed had not the presence of the radial railway made the possibility obvious.

In addition to radial railways, Hamilton had street railway service at a very early date. Electrified in 1891, electric street-cars were in operation in Hamilton before they were in Toronto. Hamilton was well called The Ambitious City.

The layout of the street railway system was such that every car, in the course of its route, traversed the track on James Street between King and York Streets. This was normal operation in a small city and was possible before the days of motor-car congestion. It resulted in a heavy concentration of business activity at King and James Streets. But the track layout was such that no other routing for the street-cars was possible. With the introduction of buses the first departure from this heavy concentration was possible.

In passing it should be said that the electric railway was very largely responsible for starting the development of hydro-electric power. Electric railways and power development went hand in hand, as it was the assurance of the electric railway power load that was the financial warrant for the initial development of central power stations.

The Hamilton Market

An historic and still very important feature in the domestic and business of Hamilton is the Market. It is probably correct to say that up to 30 years ago the street railway was as dependent on the Market as was the Market on the street railway.

Three days a week, in summer, and at least on Saturdays in the wintertime, farmers and produce growers from the surrounding countryside sell their fruits, vegetables and other home products at retail from trucks and stalls in the open air.

But the "Market" is much more. The entire area from York to Bay Street, and from King to Merrick Street, is almost entirely given up to stores, shops, hotels, restaurants, etc. catering in more or less substantial measure to those attending the market, either as sellers or purchasers, and to wholesale produce dealers and commission houses.

To attempt to move the "Market" to some other site would be to disorganize a very considerable section of retail business and to blight this whole area of the city. Moreover such a feature of long slow growth and widespread relationships, like a tree with roots widely spread and deeply fixed where it has grown from a seedling, cannot be transplanted.

It is altogether likely that as time goes on, the character of Hamilton Market will change and the area adapt itself to new conditions and new times, but desirably change should come about gradually without the disruption of the economic life and property values in the vicinity that would attend any removal of the Market to a new site.

Yet the Market straddles one of the main thoroughfares of Hamilton, York Street. If the Market is to remain, through traffic must be diverted to a new channel.

Urban Development in the Electric Railway Era

To an extent often not realized, street railways have had a most pronounced effect on the development of the cities they served.

The electric railway induced ribbon developments, great extents of purely dormitory suburbs, and a concentration of business in the downtown zone adjacent to the street railway terminal points.

Before the day of motor-cars a desirable site for a dwelling was within a short walk of a street railway line. The actual distance from the city centre was of lesser account. Similarly the most valuable business or commercial stand was as near as may be to the common central point of all street-car lines. The result was that cities in the street-car era developed with a concentration of business and cultural interests at the city centre and with long streamers of residential development along the carlines, creating in a city free to expand in all directions, a form of development more or less star-shaped. However, due to local conditions, this form of development is not pronounced in Hamilton, though concentration of retail business, etc. at the centre is distinctly so.

Due to the restrictions placed by nature on the width of the city site and consequential great spread of the city eastward, belt line operation on the street railway was virtually inevitable, though this type of operation carries with it many latent operating disabilities--which are aggravated by delays at grade crossings or from downtown congestion.

As it is to be expected that street-cars will disappear from the streets in the course of a few years, their existence need not be considered further in this report. But some general considerations must be given to the general question of transit service.

Transit Service

Hamilton is a difficult city to serve with public transit and this is particularly the case with respect to the industrial zone. The street nearest the large industries on the waterfront on which regular transit service can be economically provided is Burlington Street, but this street is from a half mile to a mile distant from the actual point of employment of the workers.

Transit service on Burlington Street can be badly demoralized by delays at railway crossings. Moreover the shortest way to and from work for the workers is in many, if not the majority of instances, via the north and south streets, and not east and west on Burlington Street.

Yet public transit service cannot be provided on every north and south street or even on every third or fourth one, as regular service in such a case would necessarily be so infrequent as to obtain no patronage. Special bus services to and from the several plants could be operated at shift hours, providing transfer service to the several cross-town lines, but this is not regular service, nor is it likely that it could be provided without special subsidy from the particular industry served.

One reason for this is best exemplified by a count made in 1934, on the spur track that then ran south from Burlington Street to the Firestone plant. The service consisted of one car giving a stub service morning and evening. The plant employed 700 employees. In the first eight months of 1934 passengers riding north-bound in the morning, all on transfers, totalled 26,000 or averaged 120 daily. Passengers riding south-bound in the evening totalled 9,750 or averaged 45 daily. That is to say, 5 out of every 8 workmen travelling to the plant by street-car found other transportation homeward in fellow-workmens' automobiles.

Under the conditions that apply in this particular district the private motor-car that can be parked on the employees' premises and carry three,

four or five employees direct to or very close to their homes, can definitely offer greater convenience to many than can the public transit service. A more direct route can be taken by the private car, and if four or five persons per car are carried the cost is not much greater per passenger.

That is to say there will be a greater use of the private motor-car as a transport medium in Hamilton than would be the case if the city's shape and topography were not so abnormal. This will necessitate more ample street facilities.

On the other hand, the shape of the City and the topography create much more satisfactory conditions for the public transport of persons from the residential areas below the mountain to the business and commercial zone. The adverse factors are the railway crossings on all approaches from the east, the great lack of off-street parking facilities, and the congestion that naturally occurs in the central zone. All present major roads lead to the centre of the City and all transit routes focus on the King - James intersection. In our opinion Hamilton has now reached the size when a start must be made to break away from this excessive concentration. This focussing of traffic routes to the central area is an underlying factor in the immediately pressing problem of access to the Mountain.

With almost no exceptions, all major streets will be travelled by public transit vehicle, but it is most unlikely that transit routes will be wholly confined to streets included in any System of Major Streets. To the extent possible, major streets will avoid cutting through residential areas, and to provide the requisite convenient service to those zones, transit vehicles may have to intersect them.

Provincial Highways

The strategic location occupied by Hamilton on the traffic lanes of the province was clearly shown in the highway development that followed immediately on the initiation of the 'good roads' movement. Highway No. 2, the main road through the province from Montreal to Windsor, passes through the westerly end of the City

by Dundurn Street and Main Street West and, latterly, via Longwood Road and Main Street. The Toronto-Hamilton section was the first (1914) paved interurban road in Canada. Highway No. 8, the main road from the Niagara Frontier to Lake Huron, traverses Hamilton from west to east via Main Street, running in common with Highway No. 2 through Westdale.

From north to south, Highway No. 6 from Georgian Bay and Guelph to Port Dover on Lake Erie, enters Hamilton via the Western Entrance and leaves via Claremont Hill and Upper James Street.

Highway No. 5 (Dundas Street) from Toronto to Brantford and London, passes less than 3 miles north of the northerly city limit, intersecting Highways No. 6 and No. 8 which provide good access to the City.

Less than 2 miles to the east of the City limit is Highway No. 20 extending from Niagara Falls westerly along the upper level, to drop down the escarpment at Stoney Creek and thence via Burlington Beach to a connection with Highway No. 2 at Burlington.

Two and one-half miles south of the southern City limit is Highway No. 53, a continuation of Highway No. 20 westerly along the Mountain-Top to a junction with Highway No. 2 west of Ancaster.

All the above are primary trunk roads of the Ontario Highways system, and the lowness of their numbers is some indication of their importance.

Subsequently, the Queen Elizabeth Highway was constructed as a dual limited access highway from Fort Erie and Niagara Falls to Toronto, relieving Highways No. 8 and No. 2 eastward and northeastward from Hamilton. This main dual artery is routed via Burlington Beach, temporarily making use of a section of Highway No. 20 pending the construction of a fixed crossing of the canal.

It is only a matter of time until provincial traffic westward from Hamilton will be similarly by-passed around the city.

A new dual highway from Windsor to Woodstock about midway between present Highways No. 2 and No. 3 has been announced by the Minister of Highways. One possibility mentioned is that this road will be routed to the vicinity of Guelph, and then directly east passing through the northerly environs of Toronto to a connection with Highway No. 2 east of that City. Another possibility is that this Highway will continue easterly from Woodstock keeping slightly to the north of the main C.N.R. Hamilton - Windsor line and dropping down the upper level at Rock Chapel to link up with the Queen Elizabeth Highway a mile or so east of Burlington. This last location would possibly be to the better interest of Hamilton.

What also seems a certainty to us is that at some time in the future a branch from this new Windsor road will be carried on the mountain level along the south side of the Dundas Valley, either keeping on the high ground to the Niagara frontier, or dropping down through Mount Albion to a junction with the Queen Elizabeth Way. Even with the first alternative, the latter connection would probably follow.

Thus none of the main provincial highways would actually enter Hamilton, and no through traffic would be routed through Hamilton unless it had specific reason to enter the city.

That is to say with the development of the King's Highway System the traffic which will be found on Hamilton streets will be solely Hamilton metropolitan traffic, with business in Hamilton. Traffic to and from the provincial roads will be traffic with origin or destination in Hamilton. The only areas whose highway link would necessarily be through Hamilton would be the portions of the Hamilton metropolitan zone around Mount Hope and the similar zone around Waterdown--both wholly inside the County of Wentworth.

But while through-provincial traffic will bypass Hamilton, a most substantial amount of traffic will use the provincial highway system, that has its origin or destination in Hamilton. It is not enough to have adequate highways for modern traffic reaching the city limits: they must equally be available inside the

City to within a short distance of each individual destination. A structure of major highways of no lesser standard than the modern King's Highway with which they will connect, should be available within the City.

Truck Transport

Hamilton is a city whose industries, essentially of the heavy variety, have been developed and are largely dependent today on the freight service provided by the steam railways. With the trend of the times it is inevitable that an increasing amount of freight will move by road. This will particularly apply to new industries of lighter character as such come to be established without railway siding facilities.

It is interesting to note the proportionate increase of motor truck registrations relative to total vehicle registrations during the past ten years in Ontario.

Motor Vehicle Registrations

<u>Year</u>	<u>Passenger</u>	<u>% of Total</u>	<u>Commercial</u>	<u>% of Total</u>
1939	593,693	88.0%	82,206	12.0%
1941	636,624	87.0%	95,022	13.0%
1943	586,036	85.7%	97,717	14.3%
1945	555,461	84.7%	100,234	15.3%
1947	645,252	82.1%	140,930	17.9%
1948	698,384	81.1%	162,589	18.9%
1949	771,709	80.8%	183,598	19.2%

The following gives a comparison of the same ratios for the Counties of Wentworth, Essex, Carleton and York (including in same the Cities of Hamilton, Windsor, Ottawa and Toronto respectively.)

Motor Vehicle Registrations
Percentage of "Commercial" to Total

<u>Year</u>	<u>Wentworth</u>	<u>Essex</u>	<u>Carleton</u>	<u>York</u>
1937	13.4%	12.9%	11.8%	13.1%
1939	12.4%	12.5%	11.5%	12.6%
1941	11.8%	12.0%	11.0%	14.6%
1945	14.5%	15.3%	14.4%	19.2%
1947	17.9%	18.1%	17.0%	17.8%
1949	19.6%	19.0%	16.5%	18.3%

It seems to us inevitable that the movement of goods over the highways will increase. For certain classes of goods and within some economic length of haul, door-to-door trans-shipment by motor truck has advantages of convenience and time-saving that cannot be gainsaid, despite a lack of clarity as to the actual economic range of such form of transport.

Seventy-five years ago when permission was granted for the railway from Collingwood to Port Dover to construct its track along Ferguson Avenue, no one at that time, it is safe to presume, had more than a shadowy appreciation of the conditions that the growth of the City and the development in size and weight of railway rolling stock would bring about on that thoroughfare.

Similarly we can only foresee in a shadowy way the conditions that the development of road transport superimposed on local freight deliveries will bring about. But one thing is certain: they will require roadway facilities radically different from those adequate for a residential or even a retail street.

The life of a city depends upon the movement of people and goods. Essentially all movements of commercial vehicles on the streets are necessary in that they have a commercial purpose. On the other hand it is very difficult to determine what proportion of automobile trips are really necessary. The cost of operating a freight vehicle is presumably the measure of its economic value to its owner and to society.

The cost of operating a private automobile can seldom bear such monetary scrutiny. But such considerations are not likely to retard its use in any way.

If the traffic problem is to be kept under control in any degree, let alone 'solved', proper provision must be made for the trunk line movement through the city of commercial vehicles, and as well the cross-city movement of private passenger cars. We have elsewhere expressed our opinion that the use of private vehicles for essential transportation will be greater than normal for a city of its size, and the use of the public transit vehicle correspondingly less.

SECTION 4

CONSIDERATIONS OF RAILWAY GRADE SEPARATIONExisting Grade Separations

A fundamental consideration in laying down a major street system is that of existing, likely and possible grade-separated crossings of the many railway lines and industrial spurs in Hamilton.

When the Great Western Railway commenced operation in 1853, its tracks were completely grade-separated from where it crossed the Guelph and Water-down-Aldershot Roads in Flamboro West Township, to Mary Street, one-quarter mile from the then east city limit at Wellington Street. Only Ferguson Avenue intervened and it had not been opened through. Advantage was taken of the neck of high ground, extending to the bay shore between Bay and Mary Streets, to depress the tracks and provide complete grade-separation through this important residential part of the early city.

When the Canadian National passenger terminals were re-arranged in 1931 the overhead bridges at Bay Street, MacNab Street, James Street, Hughson Street, John Street, Catharine Street and Mary Street were rebuilt. The bridges at Catharine Street and Mary Street are of necessity severely humped and the grades on the north side are steep.

From Mary Street easterly for the 4-3/4 miles of the city's extent, with the exception of Birch Avenue and of Kenilworth Avenue, no streets are grade-separated across the Canadian National Railway main line to Niagara Falls. Birch Avenue occupies a natural ravine which the railway crosses on a trestle. Also crossing it overhead are three industrial spur tracks, two owned by the T.H. & B. Ry., and one by the C. N. R. Except as above no grade-separation exists in the industrial area, or in fact anywhere within the city, east of Victoria Avenue.

Similarly when the T.H. & B. Ry. built through Hamilton in 1895, the presence of the Iroquois Beach and the rough ravine land to the west offered ready opportunity to grade-separate that line from Park Street to Aberdeen Avenue, and from Dundurn Street to near Aldershot.

With the construction of new passenger terminals in 1932 complete grade-separation was extended easterly to Victoria Avenue. The railway line was lifted over James Street, John Street, Catharine Street, Walnut Street, Young Street, and Victoria Avenue. MacNab Street, Hughson Street, Ferguson Avenue and Wellington Street were closed. East of Victoria Avenue there are no examples of grade-separation on the T.H. & B. and level crossings are restricted to Wentworth Street, Ottawa Street, Kenilworth Avenue, Cloverdale Avenue, Rosedale Avenue, and Cochrane Road.

The subways under the T.H. & B. tracks, while open for the full width of 66 feet, are interrupted by three lines of pillars more or less regularly spaced. The two roadways are in no case wider than 19 feet between curbs, while the sidewalks are 10 feet or more in the clear. While the roadways are theoretically wide enough for two lanes, there is a psychological hazard from the pillars on either side which, in actual use, reduce these subways to single-lane operation.

Ferguson Avenue Grade-Separation Problem

The grade crossing problem giving most immediate concern is that of Ferguson Avenue. When the line from Port Dover to Barrie was built in 1877, it descended the mountain on a continuous 1.45% grade along the side of King's Forest Ravine and the face of the mountain to about opposite Erie Street. From this point there was slack grade for half a mile, but the same maximum grade occurred on Ferguson Avenue between King and Hunter Streets. The same grade was used to underpass the Great Western Railway--now the C.N.R. main line. In 1932, in connection with T.H. & B. grade separation, the Ferguson Avenue line was lifted over Young Street subway but this maximum grade of 1.45% was not exceeded.

Other than the hump bridge on Barton Street, the Ferrie Street Bridge is the sole grade-separated crossing on this Port Dover - Barrie line. The underpass below the main line of the C.N.R. has been abandoned, and connections made to the main C.N.R. line by branch-offs at Mary Street. The section north of the main line constitutes the chief C.N.R. spur to the Industrial area.

This railway up the mountain is the only railway entering Hamilton from the south. It is not to be expected that it will be abandoned even though present traffic up and down the mountain is light. The very fact that Hamilton is a growing city makes abandonment improbable.

But rather more pertinent to the need for grade separation is the fact that the Canadian National L.C.L. freight-house and team-tracks are located on Ferguson Avenue between Barton Street and King Street and are switched from the Ferguson Avenue track. Nine lead tracks to this yard cross Cannon Street, and switching movements to it at times block all streets south of King William Street. In addition there are spur tracks to industries all the way from Young Street to Barton Street, though none between Hunter Street and Rebecca Street.

It would be difficult (and expensive) for the railway to find a more convenient freight-yard location. As well, the grade on Ferguson Avenue provides ideal switching conditions.

In our opinion the removal of the track from Ferguson Avenue and the recovery of this street for highway purposes is a possibility too remote to seriously consider. But the grade separation of this track, so close to the centre of the city and such a nuisance to the heaviest traffic movement in the city, is a pressing problem.

T. H. & B. Belt Line Track

A somewhat similar condition to the Ferguson Avenue line exists in the T.H. & B. 'Belt Line' spur to the Industrial Area located just east of Gage

Avenue. The grade on this line is far from uniform, attaining a maximum of 2.5%. It averages approximately 1.5%, and is generally more adverse than the Ferguson line. This line is constructed on private right-of-way of very narrow width.

While industries are located at either end, there are none of account between Maple Avenue and Primrose Street, so that while train movements are not infrequent, they are through movements and cause relatively short delays. On the other hand, the narrow right-of-way and high speeds create an increased accident hazard. The fact that the track diagonally crosses the intersections of Main Street and Gage Avenue creates a hazardous intersection for street traffic under almost any form of grade separation.

General Problem of Grade Separation

We have given considerable thought to the problem of grade separation, as the very numerous grade crossings now existing, and the likelihood of many more, limit the utility of many streets as traffic arteries. Before any streets could be recommended as major thoroughfares, we have had to satisfy ourselves as to the physical possibility, and the likelihood, of grade separation where intersected by railways; also as to the method of grade separation likely to be adopted in each case.

Grade separation is a costly process, and in specific cases economically, if not physically, impossible. Nor is grade separation at any point warranted if there is any possibility of the street to be grade-separated, being again crossed at grade at another nearby point at some not too remote date.

Nor is grade separation very effective unless an arterial street is fully grade-separated on a continuous alignment. Highway traffic is not properly treated if forced into a devious path of right-angled turns and back streets in order to find crossings of a railway line, where conditions of topography or railway operating problems render such convenient or cheap to install.

But having determined the streets which should be grade-separated, (and accordingly thereafter protected from any further crossings at grade), the actual planning in detail of how grade-separation is to be accomplished is a separate and special study allied with, but distinct from, that for the laying down of a major street plan.

The problem of grade separation in Hamilton is of heroic proportions. Largely as yet it is confined to the main industrial area, that is east of Mary Street and south of Barton Street, though all east and west streets (Barton, Cannon, King, Main and intermediate streets) are crossed at grade at Ferguson Avenue, and east of Gage Avenue. We have given consideration to the possibility of grade-separating this series of east and west streets, and find that same can be done without introducing more severe operating conditions than the railways now contend with. Our suggestions in this matter are set out at length in the sections following.

Grade Separation in the Waterfront Industrial Area

As regards the betterment of existing conditions in the industrial zone proper, this will entail the development of a detailed railway plan for serving the extension of this industrial area easterly and northerly, as well as in the concentration of existing railway lines and crossings to the greatest extent possible. We agree with the proposals of Mr. E. L. Cousins, in his report to the Harbour Commissioners in 1946, for major lead tracks parallel to and on the north side of Burlington Street. A particularly bad condition exists at the junction of Kenilworth Avenue and Beach Road, and it is quite possible that similar conditions will obtain to the east of Kenilworth Avenue as industrial development intensifies in that zone.

Our conclusions are that neither Burlington Street nor Beach Road can be depended upon for use as arterial streets, though they will have large purpose as components of a marginal way or service street for the industrial lands on either side, and warrant improvement for that purpose. On such a street, railway crossings to the minimum extent actually necessary,

are accepted as normal. Highway traffic is essentially local traffic, the movement of goods to and from the industries, and of employees to and from work--either in transit vehicles or in private motor-cars.

Railway crossings at grade with more or less frequent train movements, are inherent to a heavy industrial type of development. The limitations they entail upon the movements of persons and goods in the area is part of the cost of the industrial operations which create the conditions. The problem is essentially a local problem, and any betterments demanded, such as specific grade-separations, should be considered local improvements.

Having given prolonged study to this area, the difficulties of the moment, and the implications of the future, we recommend that any major highway designed to function as a main east-and-west traffic drain be located outside the range of railway complications.

Suggested Grade Separation of the Ferguson Avenue C. N. R. Line

The maximum grade on this line is between King and Young Streets where the average grade is 1.43% with a maximum of 1.47% north of Hunter Street. The grade of descent from the C.N.R. main line at Mary Street, to the industrial spur at Simcoe-Wellington Streets, is of the same order.

It is possible to elevate this line from Young Street to Barton Street, and provide full overhead clearance of 14 feet without disturbing existing grades of intersecting streets from Main Street to Cannon Street inclusive. Hunter Street would require to be depressed 5-1/2 feet and Jackson Street 3 feet to provide standard 14' clearance.

Rail level at Barton Street would be raised 3-1/2 to 7 feet, and the street dipped 13-1/2 or 10 feet to underpass it. The greater elevation of the track is only necessary if no modification of the existing spur underpassing Barton Street at the hump

bridge 300 feet east of Ferguson Avenue is found practicable (such as lowering it four feet and increasing the approach grade from the south).

Under the above proposal the track falls on a grade of 0.4% from existing level at Young Street to a point midway between Main and King Streets, and then descends on a 1.4% grade to Barton Street, and on gradually lessening grades to its junction with the main line at Mary Street. The track would be elevated on a steel or concrete trestle, full openings for the cross streets being provided.

This provides for main line traffic to Caledonia, etc. The continuance in service of the C.N.R. freight-yard is assumed, and on this basis a lead track must be retained on Ferguson Avenue from Barton Street to the north side of Rebecca Street. The nine tracks crossing Cannon Street to the freight-yard are not disturbed. A subway under these tracks can be constructed on Cannon Street at any time as a supplementary, though costly, work.

As track at grade will continue across Wilson Avenue, this most important artery must be carried under it in any case. The improvement of this street is not dependent on a major grade separation along the length of Ferguson Avenue.

Without exceeding a maximum 1.4% grade, a continuation of the Ferguson Avenue elevated track can be carried over the main line of the C.N.R. and over Wellington Street to a connection with the T.H. & B. 'Belt Line' track that crosses Victoria Avenue, as well as to the main C.N.R. industrial load; also to a proposed Harbour Commission track immediately south of Burlington Street. In so doing Wellington Street could be completely grade-separated and the Ferrie Street bridge done away with. The Harbour connection could be carried over both Burlington Street and Victoria Avenue at elevated grade, though a spur line at grade across Victoria Avenue would be required to the Harbour Commission Dock.

While this last would require considerable rearrangement of trackage on the part of the railway

companies, and the double tracking of the Ferguson Avenue elevated line, and a joint trackage agreement between the railways, it would clear the way for the development of Victoria Avenue as a major artery from Burlington Street to Charlton Avenue and the mountain, wholly free from level crossing delay and hazards.

Not the least of its possibilities is that it would permit the elimination of the T.H. & B. 'Belt Line' track across Gage Avenue, Main Street, Dunsmuir Road, King Street, and Cannon Street and greatly reduce train movements across Cumberland Avenue and Barton Street.

Except for preliminary investigation to assure ourselves of the practicability of this solution without exceeding the stated maximum grade of 1.4%, this study has not been carried out in extended detail. Nor are our basic proposals for a major street system conditional upon such comprehensive rearrangement of track facilities.

Suggested Grade Separation of the T.H. & B. 'Belt Line'

If the elimination of the T.H. & B. 'Belt Line' is not economically practical, it is possible to grade-separate it in the same manner as proposed for the C.N.R. Ferguson Avenue track, though not as satisfactorily nor as cheaply on account of the differing contour of the ground. Preliminary study would indicate this solution to be about as follows.

Track level at the crossing of Cumberland Avenue to be raised 10 feet, and the street depressed 7 feet to provide full 14-foot clearance. Raising the track materially eases the grades on the connections to the T.H. & B. main line. From Cumberland Avenue the line to fall on a 0.9% grade to King Street. This provides full 14-foot clearance over Main Street and Dunsmuir Avenue without disturbance of these streets. Maple Avenue would require to be depressed not more than 4 feet to provide full clearance. Existing sidings between Cumberland Avenue and Maple Avenue could be served by a ramp track from the high level at Maple Avenue.

From the south side of King Street, track

level to fall on a grade of 1.5% to meet existing track at Primrose Street. It will be necessary to dip King Street 2-1/2 feet, Roxboro Street 7-1/2 feet and Cannon Street 12-1/2 feet to underpass the railway. The few railway sidings between Maple Avenue and Cannon Street would be suppressed or else provided at high level. Primrose Street would be closed.

Siding conditions north of Cannon Street would not be affected. A subway at Barton Street is required as the level of the track is not altered. The street will have to dip the full amount of 17 feet.

Existing maximum grade on this 'Belt Line' is about 1-3/4% between Maple Avenue and Main Street. A grade approximating 2.5% is now accepted on the south approach to the underpass beneath the C.N.R. main line. This grade and the underpass provide a very dangerous condition at the crossing of Beach Road, and this road should be lifted over the railway.

It would be possible to eliminate the 2.5% grade above referred to by continuing the 1.5% grade northerly from Primrose Avenue. This would lower the track 7 feet at Barton Street, and require an overhead bridge rather than a subway at that street. In either case for standard clearances the vertical displacement of the street surface would be about the same, though appreciably less in the case of the overhead bridge, if present clearance under the Canadian National tracks is satisfactory to the T.H. & B. Railway.

More detailed study might show the possibility of over-crossing King Street without the necessity of depressing the road surface. This is to be desired. Again, it must be mentioned that these grade-separation studies have only been exploratory to determine the best location for major highways, as regards permanency of present conditions.

It is strongly recommended that study be given to the development of a comprehensive plan for grade separation of east-and-west streets, including study of a joint railway entrance to the industrial area along the Bay front, to eliminate as far as possible the duplication of track across the major streets,

and that this be done prior to any decision for grade separations at specific points.

Streets Not Subordinate To Railways

It is of course fully recognized that Hamilton is an industrial city and that railways must be given opportunity to serve the industries. Nevertheless the elimination of delays on the public streets is a factor in the economy of the city, as also of the industries, both permitting the transport of workers to and from their jobs and also (to an extent already heavy, and certain in a motor age to increase many fold), the transportation of goods to and from these industries. Canada has had its great development in the railway age, and during that period has definitely sacrificed the alignment and grade of its highways to railway exigencies. There is no reason why this bad habit should continue. Highway considerations should have equal attention.

It should be manifest from the foregoing that the grade-separation of any single railway crossing cannot be considered by itself. A method of grade-separation arbitrarily adopted at one street crossing will govern the method later to be adopted at many streets on either side, and more than likely will entail greater expenditure and less satisfactory arrangements, than if the entire work had been planned as a unit, to be carried out in sections as need be.

SECTION 5

TRAFFIC MOVEMENTSTraffic Counts - April 1950

At our request a series of traffic counts were made by the Planning Department during April. Counts were made at 93 points covering 97 two-way movements. These points created a series of cordons dividing the city into various areas, so that a complete count of all traffic moving into and out of each area was obtained. These counts covered the points from 6 AM. to 9 PM., and were segregated into 15-minute intervals. Automobiles, light trucks, heavy trucks, buses, bicycles, horse-drawn vehicles and street-cars were separately recorded.

The all-day total movements subdivided into the above categories is appended as Schedules 1 - X. Schedule I assembles all the traffic flowing into and out of the downtown area bounded by the outer limits of Wellington Street, Hunter Street, Bay Street and Vine, Gore and Wilson Streets.

Schedule II assembles all the traffic into and out of the Central Area between Wellington and Bay Streets, from the foot of the Mountain to the Waterfront.

Schedule III similarly shows the traffic into and out of the West Central Area as defined by the base of the Mountain, the Waterfront, Bay Street, and the Chedoke Ravine and Desjardins Canal.

Schedule IV similarly covers the East Central Area, as defined by Wellington Street, the T.H. & B. main line, the T.H. & B. 'Belt Line' and the shore line of the Bay.

Schedule V segregates the industrial zone of the above East Central Area lying north of the main C.N.R. Line between Wellington Street and the T.H. & B. 'Belt Line'.

Schedule VI gives all the traffic up and down the Mountain within the city limits, and as well the traffic moving across Fennel Avenue on King's Highways No. 6 and No. 55.

Schedule VII provides complete statistics of the traffic through the various throats providing entry and exit into the Westdale - West Hamilton Area, as well as traffic on Main Street at about the peak point within the area.

Schedule VIII gives the record of the traffic movement across the oblique intersection of King Street East and Main Street East, and of the movement where Main Street East forks into Highway No. 8.

Schedule IX gives the traffic movement across the approximate east city limit.

Schedule X assembles all the traffic flowing into and out of the downtown area bounded by the outer limits of Hunter, Bay, Vine-Wilson, and Wellington Street.

As taking of these counts was spread over a month or more, it cannot be expected that they will balance out exactly, even though traffic movements from day to day are surprisingly uniform. These counts represent the average normal day, namely Monday, Tuesday, Thursday and Friday, being confined to these days.

The purpose of a cordon count is primarily to gain a general sense of the traffic flow throughout the city.

In attempting to interpret counts of this nature, a person must have knowledge of the general layout and make-up of the city, as well as some experience in the taking and analysing of counts, in order to be able to appreciate both their limitations and their special values. The most valuable information to be learned from counts is only available when the same counts are repeated at intervals. The increase or decrease of travel in general and at specific points is then definitely known, and increasing preference or dis-

favour for certain routes becomes apparent.

It is hence recommended that the counts made this Spring be repeated at intervals of not more than five years, and the record of all these counts carefully preserved.

It should also be pointed out that, because an exceptionally heavy movement is noted at a particular intersection, that that condition does not necessarily demand increased traffic facilities at that particular intersection. It may be that there is no other route available for the traffic in question, or none more satisfactory as regards time consumed, pavements, grades, etc., and the provision of a relief artery, even at some distance away, may be the solution of the difficulty. A very important phase of the traffic problem is to determine as well as may be done, why traffic moves as it does. At times a great deal of traffic congestion is created because many persons like to go where the crowds are.

Traffic In and Out of the City

The total traffic moving across the city limits is about as follows. The cordon did not include minor roads on the top of the mountain.

Limit	Schedule and Direction	Autos	Light Trucks	Heavy Trucks	Buses	Cycles	Horse Drawn	Total
East	IX In	6458	1332	586	115	105	-	8596
"	Out	6463	1295	594	116	84	1	8553
South	VI In	2465	648	240	24	54		3431
"	Out	2210	629	212	26	59	2	3138
West	VII In	4909	1025	658	137	89		6818
"	Out	4671	1001	626	131	88		6517
North	III In	3705	707	434	71	31		4948
(W. Entr)	Out	3850	771	439	68	30		5158
Total	In	17537	3712	1918	347	279		23793
Total	Out	17194	3696	1871	341	261	3	23366
Accumulation - 9 PM.								
(Approximate only)		343	16	47	6	18	3	427

Traffic In and Out of Downtown Area

The following is a summary of the traffic moving into and out of the 'Downtown Area' bounded by Hunter Street, Bay Street, Vine, Gore and Wilson Streets, and Wellington Street.

Traffic	Category	South Side	West Side	North Side	East Side	TOTAL
Autos	In	9352	13093	12169	10381	44995
"	Out	8529	12130	11544	10449	42652
Light Trucks	In	1787	2938	3637	2063	10425
" "	Out	1745	2997	3575	2150	10467
Heavy Trucks	In	538	688	1161	223	2610
" "	Out	507	1056	960	449	2972
Buses	In	469	682	190	336	1677
"	Out	468	667	196	337	1668
Bicycles	In	448	371	609	641	2069
"	Out	481	292	598	641	2012
Horse-Drawn	In	50	62	136	60	308
" "	Out	55	54	119	66	294
Street Cars	In	--	--	311	316	627
" "	Out	--	--	306	322	628
Total	In	12644	17834	18240	14024	62738
Total	Out	11785	17196	17324	14414	60719
Accumulated - 9 PM. (Approximate only)						2019

It is worthy of note that a considerable part of the traffic from the extended and heavily populated east end enters and leaves the retail and commercial downtown via the north side (to Cannon and Barton Streets)

East and West Flow of Traffic

Vehicles	Direction	TH & B Ry Belt Line	Wellington Street	Bay Street	Chedoke Valley Desjardins Canal
Autos	West Bound	18991	24068	20103	11590
"	East Bound	18458	23110	21460	11909
Light Trucks	W.B.	3859	5722	4888	2454
" "	E.B.	3771	5389	4918	2446
Heavy Trucks	W.B.	1322	1073	1740	906
" "	E.B.	1655	1665	1338	804
Buses	W.B.	654	601	821	411
"	E.B.	631	606	833	412
Bicycles	W.B.	667	1393	607	287
"	E.B.	632	1410	714	279
Horse Drawn	W.B.	156	182	153	12
" "	E.B.	109	164	144	11
Street Cars	W.B.	406	638	--	--
" "	E.B.	396	648	--	--
Total	W.B.	26055	33677	28312	15660
Total	E.B.	25652	32992	29407	15861
Total	Two-Way	52707	66669	57719	31521

The preponderance of the east side of the city both as regards extent and amount of traffic is indicated above. Wellington Street is the easterly edge of the retail and commercial downtown. The Chedoke Ravine and the T.H. & B. Belt Line are equidistant from Wellington Street.

Traffic To and From the Mountain

The counts of traffic on the mountain roads made last April, as set out in Schedule VI appended, were taken at the foot of the hill. There is quite a substantial cross-town movement along Mountain Boulevard, so that the total traffic listed in Schedule VI is in excess of the movements between the upper and lower levels of the city.

In September 1949 counts were taken from 4:30 to 6:00 PM. of all traffic movements at the several intersections along Mountain Boulevard from John Street to Ottawa Street. It is thought that the average of this two-way traffic would fairly represent the daily movement. An analysis of this count gives very interesting results.

Mountain Boulevard

Of traffic leaving John Street going east on the Mountain Boulevard

65%	came from James Street or West
17%	" " the north via John Street
18%	" " Arkledun Avenue

Of this traffic

45%	went down Charlton Hill (estimated 10% from Arkledun Avenue and 35% from James and west)
27%	went to Ottawa Street (estimated 8% from Arkledun Avenue and 19% from James Street)
28%	went out Sherman Cut (estimated 17% from John Street and 11% from James Street)

Of traffic westbound on Mountain Boulevard arriving at John Street

75%	came from Charlton Hill (estimated 30% destined for Arkledun Avenue and 45% for James Street and west)
9%	came from Ottawa Street
16%	" " Sherman Avenue Cut

Averaging the above, 22% of the traffic on Mountain Boulevard at John Street was to or from the mountain level at Sherman Avenue and 78% was cross-town traffic between John Street and Charlton Avenue or Ottawa Street. Of this last 78%, almost one quarter was from or destined to the top of the mountain via Arkledun Avenue.

Charlton Hill

Of the traffic ascending Charlton Hill

52% went to John Street, destined 22% for Arkledun Avenue and 30% for James Street and the west end

48% went to the Sherman Avenue Cut

Of traffic down Charlton Hill

77% came via the Mountain Boulevard from John Street, divided 50% from James Street and west, and 27% from Arkledun Avenue

23% came from Sherman Avenue Cut

The above represents an average movement up and down the mountain via Sherman Avenue Cut of 36% of the traffic using Charlton Hill, while 64% of this traffic was a cross movement to John Street.

Ottawa Street

Of traffic leaving Ottawa Street on Mountain Boulevard

21% was destined for Flock Road
 66% " " " The Sherman Avenue Cut
 13% " " " John Street, divided
 3% for Arkledun Avenue and 10% for James Street and west

Of traffic reaching Ottawa Street by the Boulevard

24% came from Flock Road
 46% " " the Sherman Avenue Cut
 30% " " John Street (8% from Arkledun
 Avenue and 22% from James Street and
 west)

Of the total traffic on Mountain Boulevard at Ottawa Street, the above represents a cross-town movement of 22%, with traffic to Flock Road 22%, and traffic to Sherman Avenue Cut 56%.

Estimated Traffic to Mountain Top

Adjusting the April counts (for autos and light trucks) in accordance with the above, the following estimate of movement up and down the mountain is obtained. As the counts of April last show almost no heavy truck traffic on the Boulevard at John Street, no adjustment is made for this or miscellaneous traffic.

	<u>Autos</u>	<u>Lt.Tr.</u>	<u>H.Tr.</u>	<u>Bus</u>	<u>Bicyc</u>	<u>H.D.</u>	<u>Total</u>
<u>Southbound</u>							
Becketts Dr	786	141	3	-	20	6	956
James St-Mt.Rd	630	34	1	-	-	4	669
Arkledun Ave	4078	834	283	309	28	4	5536
Mountain Blvd	371	66	3	6	14	2	462
Charlton Hill	646	75	86	2	15	2	826
Ottawa Street	1075	280	13	-	9	-	1377
	<u>7586</u>	<u>1430</u>	<u>389</u>	<u>137</u>	<u>86</u>	<u>18</u>	<u>9826</u>
<u>Northbound</u>							
Becketts Dr	827	125	2	-	21	7	982
James St.Mt.Rd.	508	62	9	-	4	2	585
Arkledun Ave	4990	980	232	313	64	3	6582
Mountain Blvd	290	48	2	5	10	3	358
Charlton Hill	807	74	56	3	17	2	959
Ottawa Street	966	243	4	-	10	4	1227
	<u>8388</u>	<u>1532</u>	<u>305</u>	<u>321</u>	<u>126</u>	<u>21</u>	<u>10693</u>
Accum. at 9 PM in Downtown	802	102	84	4	40	3	867

The outstanding place of Arkledun Avenue as a traffic Artery to and from the Mountain is apparent from the foregoing. Almost 60% of all traffic up and down the mountain makes use of Arkledun Avenue, and almost one-third uses Claremont Hill.

Sherman Avenue Cut carries virtually all the mountain traffic from John Street and Charlton Hill and an estimated 72% of that from Ottawa Street. The relative use of the several entrances to the mountain is about as follows:

Claremont Hill	-	32.5%
Jolley Cut	-	26.5%
Sherman Av. Cut	-	22.0%
Becketts Drive	-	9.5%
James St.Mt.Rd	-	6.0%
Flock Hill	-	3.5%

Of the traffic traversing in whole or part Mountain Boulevard, as nearly as may be, 50% is to and from the Mountain-Top, and 50% is a cross-town movement.

Traffic on Main Street

The following statistics of the total traffic movement at various points along the length of Main Street and Highway No. 8 are interesting.

Normal Day - 6 AM to 9 PM

<u>Location</u>	<u>Westbound</u>	<u>Eastbound</u>	<u>Total</u>
Potruff Road	2569	2952	5521
Strathearne Ave	3657	3105	6762
Fairfield Rd	4794	4325	9119
East Side King St	6598	6202	12804
West Side " "	5282	6378	11664
T.H.& B.Spur Gage Ave.	5384	5861	11245
East side Wellington	7398	7832	15230
West side Bay Street	5893	6514	12407
Tope Avenue	3878	4125	8003
Leland Street	6034	5934	11968
Norfolk Street	3191	3429	6620
Fork,Highways 2 & 8	2094	2608	4702

The very high level of traffic at King Street East crossing and again at Leland Street in West Hamilton are of special interest.

Intersection of Main Street East and King Street East

This oblique intersection of two of the chief streets feeding the east end of the city is a point of major congestion, and will ultimately require some special treatment such as prohibiting the direct crossing of the intersection or even some form of grade separation.

Arriving at Intersection: 19,948 Vehicles

From the East	-	6598	Vehicles arrive via Main Street
		3410	" " " King Street
		<u>10,008</u>	Total from East

From the West	-	6382	Vehicles arrive via Main Street
		3558	" " " King Street
		<u>9,940</u>	Total from West

Departing from Intersection: 19,948 Vehicles

For the East	-	6206	Vehicles depart via Main Street
		3734	" " " King Street
		<u>9,940</u>	Total Eastbound Departures

For the West	-	5282	Vehicles depart via Main Street
		4726	" " " King Street
		<u>10,008</u>	Total Westbound Departures

Maximum Two-Way traffic is on Main Street on the East Side of the intersection

6598	Vehicles arrive from East
6206	" depart for East
<u>12,804</u>	Vehicles Two-Way all-day movement.

Points of Heavy Traffic

The points of heaviest traffic met with in the count of April last were as set out below. It is possible that these are among the heaviest points in the city, but no attempt was made to determine at what point the heaviest movement occurred.

Two-Way Traffic at Heavy Point (6 AM to 9 PM Normal Day)

<u>Location</u>	<u>Autos</u>	<u>All Trucks</u>	<u>Buses & St. Cars</u>	<u>Total Vehicles</u>
Main St. at Wellington	11656	2645	557	15230
Main St. at East Side				
King Street	9687	2226	537	12804
Main St. at Bay Street	9513	2009	749	12407
Arkledun Avenue	9068	2329	622	12108
Main St. at Leland St.	8373	3090	270	11968
Main St. at West Side				
King Street	8822	2012	579	11664
Main St. at T H & B Spur	8512	1943	582	11245
Cannon St. at Wellington	7687	2618	417	11131
Barton St. at Wellington	7288	2313	407	10478
York St. at Bay Street	6671	2981	272	10153
Western Entrance	7555	2351	139	10106

The very heavy east-west movement through the heart of the city is clearly indicated by the above. With the exception of Arkledun Avenue, all the above points are on the east-west axis of the city.

SECTION 6

USE-ZONING

Any system of major streets must take into account the proposals for use-zoning throughout the city and environs. In fact the layout of traffic arteries is the primary consideration in city planning, as these form the structure around which the city builds itself. Use-zoning must be co-ordinated with the traffic plan, as both in turn must conform to the natural topography.

The provisions of the zoning by-law do not materially differ from the trend of existing uses. In broad outline all the waterfront east of Wellington Street and south of Barton Street is reserved for industry. Extensions of this area reach as far south as Cannon Street on either side of Ferguson Avenue. Alternatively there are three or four small blocks of residential area preserved north of Barton Street.

Other areas open to heavy industry are on the waterfront west of Bay Street, with a talon along Bay Street extending almost to Cannon Street, and in the area west of Dundurn Street between the T.H. & B. Ry. and Main Street, including the Chedoke Valley as far west as Paradise Road.

Areas open to light industry generally adjoin the areas of heavy industry. These include the Chedoke Valley north of Main Street and roughly the area lying between York, Merrick and Rebecca Streets and the heavy industrial zone from Queen Street to Wellington Street; also essentially the whole area from Barton Street to Wilson Street and from Wentworth Street to Sherman Avenue. Also lands adjacent to the T.H. & B. Railway from Ferguson Avenue to Gage Avenue, and a large block (with minor exclusions) from Beach Road to north of the C.N.R. main line from Parkdale Avenue to the Redhill Creek Ravine, as also an area between King Street and Lawrence Road, east from Kenilworth Avenue, and an area on the west limit of the city southerly from Main Street are zoned for this use.

For use as the main business and commercial section is assigned the area between Merrick and Rebecca Streets on the north and Hunter Street on the south, between Caroline Street and Ferguson Avenue, with an extension between James and John Streets to Young Street. Local business is allowed virtually throughout the whole extent of Barton Street, Cannon Street, York Street, King Street, Main Street, Dundurn Street, Locke Street, Ottawa Street, Kenilworth Avenue and Parkdale Avenue, and on parts of Concession Street, Upper James Street and Fennel Avenue. All the rest of the area is residential of one type or another, a large section adjacent to the downtown on the south side, from Queen Street to Sandford Avenue, being zoned for apartment buildings.

From the above very general description of the zoning map, it will be noted that York Street and Wilson Street follow the dividing line between essentially residential and essentially industrial areas from Dundurn Street to Caroline Street and from Wellington Street to Sherman Avenue. Between Caroline Street and Wellington Street Vine and Gore Streets border the central business and commercial area. It is also to be noted that the development of a through street by linking, Young Street, Alanson Street, Cumberland Avenue and Lawrence Road would create a marginal way linking the various industrial zones bordering the T.H. & B. Railway. It would also relieve the residential streets to the north, from commercial and through traffic.

Sufficient has been noted in the above to show that full consideration has been given in our studies to the implications inherent in the zoning plan.

SECTION 7

ONE-WAY STREETS

In all cities, streets of very narrow width are restricted to one-way movement to avoid complete blockade. One-way streets are also a useful expedient in a city with a perfect or near perfect checkerboard plan, where for each street in one direction there is a corresponding parallel through street close to it (within 300 feet or 400 feet at most). New York and Philadelphia are cities obviously suited for one-way traffic on the cross streets. Those in New York spaced 266 feet apart, centre to centre, running from side to side of Manhattan Island and numbered consecutively, are ideally suited to one-way operation. The same applies in Philadelphia where the cross streets are very narrow. In the typical Spanish Colonial city such as Mexico or Havana, where the streets in the downtown are narrow but form a perfect checkerboard, one-way traffic has been in effect since street-cars were introduced more than 70 years ago.

In Portland, Oregon, which lately introduced a comprehensive one-way traffic operation, the streets in the downtown area form a uniform checkerboard for 25 blocks in each direction (over two miles).

But unless specially favourable conditions are present as in Portland or in New York, or specially unfavourable conditions such as very narrow streets of only 2 or 3 lane width, the use of one-way streets is not usually desirable.

This last in our opinion is the case in Hamilton. There are no conjugate pairs of streets in the central downtown, and certainly none running east and west. King and Main Streets are about 300 feet apart at Wellington Street but separate widely both in the east and west ends. King William Street is not an equivalent street to King Street in width or as a through street. And so on.

There would seem more opportunity for one-way traffic on north and south streets. John and James Streets are of fairly equivalent width, run from the bay to the mountain face, but are 750 feet apart, and have radically different outlets up the mountain. Victoria Avenue and Wellington Street are also 750 feet apart, but Wellington Street ends at the T.H. & B. Railway. A similar pair are Wentworth Avenue and Sandford Street, but the latter is blocked south of Barton Street by the Canadian Westinghouse Company Plant. While north and south streets are short intervals apart, almost none of them, other than the original township side lines, are open across the Canadian National Railway.

There is another consideration to be taken into account when suggesting one-way streets. That is the desirability of concentrating heavy traffic on certain arteries rather than disseminate it through residential streets. For example Dunsmuir Avenue parallels Main Street 650 feet away for 3 miles. But its value is as a purely residential street free of heavy traffic, and as long as possible this character should be preserved.

The preservation of residential streets from the disabilities of heavy through traffic is an important factor in our recommendations.

There would seem some opportunity for one-way traffic on north and south streets. Some city lanes are of fairly significant width, run from the city to the mountain side, and are 700 feet apart, and have relatively different widths up the mountain. Victoria Avenue and Wellington Street are 750 feet apart, but Wellington Street is only 700 feet apart. A similar pattern is seen on Avenue and Sandford Street; but the latter is blocked south of Barton Street by the Canadian West Coast Company Plant. While north and south streets are short intervals apart, almost none of them, other than the original township side lines, are even better than Canadian National Railway.

There is another consideration to be taken into account when suggesting one-way streets. This is the possibility of concentrating heavy traffic on certain arteries which then disperse it through residential streets. For example, Dunsmuir Avenue parallels Main Street 500 feet away for 3 miles. But its value is as a heavily residential street from its heavy traffic, and as long as possible this should be preserved.

The preservation of residential streets from the classification of heavy through traffic is an important factor in our recommendations.

SECTION 8

THE PARKING PROBLEM

The General Problem

The parking problem is one of the most difficult to solve of all problems facing municipalities, in view of the great expense entailed. The motor vehicle is relatively new and is not yet fully integrated into our civilization. Its use is seldom wholly governed by economic considerations, but quite as much by the personal convenience it affords.

Yet it is that phase of personal convenience, both in industry and in our domestic and social affairs, that assures a continuing and expanded use of the motor vehicle. In turn the problem of street congestion created by that continuing and expanding use can only be kept within bounds by the progressive elimination of all car-parking on the streets, to free them for their primary purpose.

The use of any part of the public highway for the storage of chattels may only be tolerated when such does not conflict with the utilization of the highway for its primary purpose. A very old judicial decision has it that "in a highway the King hath but the passage for himself and his people" (1 Roll. Abr. 392, Lib. Chemin). The parking of motor vehicles on the public street is not a right, but at most a very temporary privilege.

This was tritely expressed in a decision by Chief Justice Lord Ellenborough, 138 years ago: "The King's Highway is not to be used as a stableyard". (Rex vs Cross 1812). Motor vehicle transportation, like other forms, consists of three components: the vehicle, the road on which to run, and the place or places off the road where the vehicle can be stored when not in active use. The cost of providing these three components is the cost of motor vehicle transportation.

The parking meter is not an acknowledgment of any right to park on the highway. It is an expedient of traffic regulation permitted by statute to drive away the all-day parker in favour of ten, twenty or more short-term parkers. Actually short-time parking aggravates the traffic problem by the constant manoeuvring of vehicles in and out of parking spaces to the detriment of moving traffic. But the public acceptance of the parking meter definitely indicates a willingness on the part of motorists to pay something for parking privileges at reasonably convenient locations.

The magnitude of the parking problem is seldom realized, but is very easily stated. If every person working in the commercial and retail area of any city came to work by motor-car, one half the floor space in that area would be required to store the cars in which they travelled to and fro to work, with nothing provided for the cars of shoppers or other persons with incidental business in the area. (On the basis of a minimum 170 sq. feet per parking space, requiring attendant parking, and of the universal density factor of 1.7 passengers per vehicle, 100 square feet of parking space per person is required, directly comparable to the average floor space per occupant-employee of a commercial building.)

The fact is that the solidly built-up type of city that developed during the street-car era is not well suited to the need of automotive transportation. If we are to fully satisfy the demands of the motor vehicle, our cities must be completely rebuilt, if we refuse the automobile entrance to our cities in an automotive age, our cities will wither. A compromise of sorts must be worked out.

Parking in Hamilton

In our opinion the answer to the problem of parking in Hamilton is the provision of off-street parking facilities - "stableyards" in the language of 1812. Under Section 404, Subsection 46 (a) of The Municipal Act, a municipality is given power to acquire and establish off-street parking facilities, provided a fee is charged for the use of these.

The following table is taken from the report of the
Committee on the subject of the proposed
amendment to the Constitution of the United States
which was adopted by the Convention of 1787.
The table shows the number of States which
have adopted the amendment, and the number
of States which have not adopted it.

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of States which have not adopted it.

It should be noted that this opinion relative to municipal car-parks is expressed with reference to Hamilton specifically, and might not apply to all cities. The readiest solution to both the traffic problem and the parking problem is maximum use of mass transportation. But this report deals with Hamilton as it develops to a city of 500,000 population, with an urban nucleus extending at most 5 miles from the business centre. It will not have the size, nor has it the topographic layout, that lends itself to underground 'rapid transit' train operation. It must depend on surface transportation and that now means buses or trolley coaches. Due to the mountain barrier, the location of the industrial zone, and the great number of railway crossings at grade, Hamilton is a difficult city in which to provide public transit service at normal fares that will be wholly convenient for everyone, so that greater than normal dependence will be placed on private means of transportation. Density of ownership of automobiles will be high. There will be corresponding great demand for off-street parking space, in the commercial and shopping centres, in the industrial areas, and in the residential areas of the older sections of the city.

The older parts of Hamilton are greatly over-built. Building lots are small, and yard space almost non-existent or very limited. Land is divided into small holdings, and vacant or derelict parcels readily available for off-street parking are very few and of small size, and what do exist are not readily capable of expansion due to the presence of new or at least useful buildings adjacent.

Schedule X appended, gives an accurate statistic of the number of vehicles accumulated in the 215 acres bounded by Wellington, Hunter, Bay and Vine--Gore Streets which constitute the commercial and retail heart of Hamilton. By 9:15 A.M. 2655 automobiles had accumulated in this area. By 11:15 A.M. this number had increased to 3199. It fell very little over the noon period (to 2908 at 1:15 PM) and then rose to 3137 at 3:45 PM. By 6:45 PM the number had fallen to 1199, and at 9 PM had risen again to 2197.

The maximum number noted above is 9.7% of the number of automobiles registered in the city, and 7.2% of all registered in the entire County. This count represents the average normal day, and traffic on Saturday mornings is much in excess of the above. The parking facilities, both on and off the street in the central downtown (whether restricted to a limited time or available for all-day storage) are fully occupied every business day. The same may be said for a considerable zone beyond the downtown area.

An immediate program to provide off-street parking facilities for 5,000 cars in the immediate vicinity of the central business area would not be over-generous. Further space would be added as the need required, as our recommendations are based upon the assumptions that off-street parking facilities will be charged for at rates that will make them self-sustaining and that on-street parking will be strictly regulated.

Both short-time and all-day parking facilities are urgently needed elsewhere than in the central downtown, for example, along the whole extent of Barton Street, and at the Delta and similar local shopping centres. In some of the older residential areas, where no rear yard space is available for private garages, or if available is inaccessible, space for over-night parking is equally necessary.

Off-Street Parking

Off-street parking is of two general types, on the natural surface in parking lots, or in multi-floored parking garages. Since only space for parking is at issue, the only garages considered herein will be of the open deck type of good architectural design. Whether parking lots or open-deck garages are adopted is essentially a matter of relative cost.

It is hardly to be expected that a four-level open-deck garage could be constructed at present day costs for much less than \$1000 per car space including cost of site. Parking lots could now be acquired and improved for 20% to 25% less per space. Moreover on

the land so acquired open-deck garages could be constructed at some later date, after land values had so increased as to render further land acquirement for parking lots uneconomic.

The operation of a parking lot per car space is much less costly than is that of any type of garage where attendant-parking is usually required. (On the other hand up to 50% more cars can be stored on a given area with attendant-parking.) Self parking is more in keeping with modern habit. It also permits the use of parking meters for the collection of tolls. To but a very limited extent can any form of attendant-parking be deemed short-term parking.

Daily Earnings Required to Support Municipal Parking Facilities

On the basis of $3\frac{1}{2}\%$ interest on borrowed funds amortized over 25 years, 7% of initial cost must be paid annually; another 2% is allowed to the City in lieu of taxes. \$30 per parking space annually is estimated to cover maintenance and miscellaneous, wages of attendants and administration of the facility assuming self-parking operation. Allowing 280 square feet gross per space, and on the basis of 300 days per year, the daily revenue necessary to meet expenses is 26.8¢, 35.2¢ and 43.6¢, in the case of land, surfacing, etc. costing respectively \$2, \$3, or \$4 per square foot.

On an attendant-parking basis, costs of labour will increase \$20 per space, but 170 square feet per space is adequate. For the same average costs of land, surfacing, etc. the daily return necessary is 27.1¢, 32.2¢, and 37.3¢.

Open-deck parking garages are little more than three or four parking lots superimposed one above the other. The height between floor levels can be kept to 10 feet or less. The sides can be left open, or filled-in with grille work where architectural appearance is a factor. These garages can be laid out for self-parking or attendant parking, but in view of the usually higher cost per square foot of floor space, parking space and aisles are kept to minimum possible size, and attendant-

parking is usual. Where due to the contour of the ground, access can be obtained at two or more floor levels, any disabilities as regards self-parking disappear.

Based on prewar examples adjusted to present costs, an open-deck garage structure exclusive of land could, we estimate, be erected for around \$500 per car space for attendant-parking, or \$810 per space for self-parking. Including land at \$3 per square foot, and any equipment such as meters, etc., the cost per space in a four-level open-deck garage on a self-parking basis, is \$1100, and on an attendant-parking basis \$660.

On the other hand attendant-parking in a multiple storey garage, will double--if not triple--the wages of attendants per car space over that required for attendant-parking on a parking lot. On the above basis the daily revenue per space needed to meet costs on a self-parking basis would be 49¢, and on the attendant-parking basis 53¢.

It would appear from the above that a daily income per car space of 27¢ to 44¢ per day per car space would be necessary in the case of a car lot, and 49¢ in the case of a deck garage. In both cases self-parking is assumed.

The average revenue per parking meter in Hamilton is slightly over 22¢ per day. (300 days per year). This is on the basis of 10 hours' operation daily. Off-street parking would be revenue-producing 24 hours per day at rates fitted to the demand.

Underground Parking Garages

When no other alternative remains, underground parking garages are possible. The cost of such facilities would hardly be less than \$2000 per car space exclusive of land costs, if any. The matter of entrance and exit to an underground garage constitutes a special traffic problem not always easy of solution. They are practical only when parking space cannot be provided in other ways at any less cost, which limits them to cities of at least a million population.

A news item in the Los Angeles Times of August 15th last records the signing of a contract for the construction of an underground parking garage for 1650 cars under Pershing Square in that city, to cost around \$5,000,000. This facility, to be built by a private company, will revert to the City in fifty years.

A press dispatch from Montreal of July 11th last reported a project in that city for the construction of underground accommodation for 1520 cars at an estimated cost of \$3,000,000.

The Pittsburgh program to provide 26,000 off-street parking spaces of various types had an estimated cost in 1947 of \$34,500,000 (I.T.- E. Proceedings 1947).

Basic Considerations for Off-Street Parking

Essential to any off-street parking program is severe restriction of on-street parking, with strict enforcement. No pay-parking lot can earn its costs if in competition with tolerated free parking. Nor will any private investor chance investment in private parking facilities in competition with tolerated curb-parking, unless he has an ancillary reason for so doing, such as service to customers or employees. Even when a municipal government has promised to restrict parking as an inducement for the establishment of private parking lots, it often finds it politically difficult to do so. Only when the municipality itself is financially interested in off-street parking, will off-street parking space accomplish its basic purpose of eliminating parking on the streets.

As well, only municipally-owned parking facilities can be classed as permanent. Most private car lots are in use as such only until the land can be profitably sold. As well, only the municipality with its powers of expropriation can be sure of assembling sufficient land at key locations for maximum utility as car parks. But while municipal ownership of the facilities is in our opinion essential, the matter of operation, whether direct by the municipality, or through a city-appointed commission, or by private interests under some form of concession, is not of moment.

With the establishment of stricter regulations governing parking on the streets, will come a commercial urge for stores, theatres etc. to establish customer parking lots permanently dedicated to such use, and not subject to sale for building purposes at any opportune moment. There will also be fuller justification in the provision of zoning by-laws requiring the provision of parking space by assembly halls, etc.

It is to be expected that nearness to parking space will add to the value of adjacent properties for commercial purposes, and the question of assessment for benefit arises. In our opinion any such increase of value will be reflected in the assessment of each particular property, and the city will benefit accordingly through normal taxes.

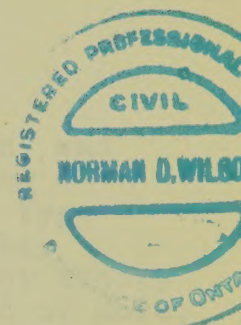
The distance that a motor car user will walk from a parking lot to his ultimate destination depends on the size of the city; in other words on the distance he is able to drive before he must park and continue on foot or by public transportation. If he can travel five miles by automobile, he may be quite prepared to walk the last half mile to his destination. If the distance he comes by car is only a mile, to walk the last thousand feet is a grievance.

It is a foregone conclusion that until ample off-street parking space is available, parking on the streets must be tolerated (in decreasing degree), but that should not mean free parking. As has been mentioned the use of the parking meter on the streets is as a means of regulation, and not primarily for the collection of revenue. Yet even on the very minimum base of charge of 1¢ per 12 minutes during an operating day of 10 hours only the gross intake of a meter ranges from \$60 to \$80 per year. Any surplus revenues over cost of maintenance, revenue accounting, etc. from parking meters on the streets should be used to provide additional off-street parking facilities, as also should any surplus from the operation of these off-street facilities.

The City of St. Catharines has special legislation obtained in 1949 which requires the earmarking of any profit from the operation of its parking meters for traffic betterments, including the provision of

off-street parking. It is recommended that Hamilton seek similar legislation. Without such legislation the disposition of any accumulated profit is solely at the discretion of succeeding Councils. The St. Catharines legislation is attached as Schedule XI.

A MAJOR STREET PLAN FOR HAMILTON



DIVISION "B"

RECOMMENDATIONS AND CONCLUSIONS

SECTION 1

THE PHYSICAL STREET SYSTEM

In the foregoing chapters we have referred to some of the more patent factors that enter into the street problem of Hamilton. These include:

1. The position of Hamilton at the confluence of historic and natural traffic routes, most readily described as those followed by Highways No. 8, No. 2 and No. 6. The founding of the city at this confluence, and the stabilization of this vicinity as the business heart of a metropolitan city, without material changes in the original village street system, and the attendant downtown traffic problems arising from these factors.
2. The topography of the city site, namely its situation on the narrow flat between the Mountain and Burlington Bay; its limited means of outlet to the north, and the difficulties of creating outlets for expansion to the south, with the resulting extension of the city east and west in a narrow belt.
3. In turn the relative fewness in number of streets running east and west, and contrariwise the preponderant number of streets running north and against the direction of major traffic flow, with definite detriment to the movement.

4. The great industrial development of Hamilton, and the preponderance of heavy industry requiring railway sidings. The concentration of this type of development on the flat lands along the bay shore. The resulting great number of railway tracks crossing streets at grade and the likelihood of more, and the great difficulty of accomplishing grade separation on the low flat terrain.
5. The railway tracks crossing all east and west streets on Ferguson Avenue and east of Gage Avenue, and the fact that each of these tracks should be grade-separated from the many streets it crosses, in accordance with a unitary comprehensive plan.
6. The great difficulties these conditions place in the way of providing convenient and economical transit service, with the certainty that private means of transportation will be used to a great extent, requiring more street space than would otherwise be necessary.
7. In view of the trend of the times, the certainty that truck traffic, both local and interurban, will steadily increase. This is bound to come about with the decentralization of industry, whether on the part of shippers or consignees.
8. The anticipated growth of Hamilton to a possible 500,000 population during the next half century, (200,000 on the mountain) with proportional development throughout southern Ontario. With this development and the increasing use of motor vehicles traffic on the downtown streets will be fully four times that now experienced.
9. The desirability of preserving residential area by diverting, as far as practical to do so, heavy and volume traffic from residential streets.
10. The tremendous density of development in the older parts of Hamilton. Building lots are very small, with only a very small proportion of each lot not built upon. Vacant areas in the interior of blocks, are almost non-existent, and rear yards where existing in residential zones are inaccessible. The parking problem is the chief component of the traffic

problem as it presently exists.

11. Existing streets, if relieved of the disabilities of grade crossings, and pavements of inadequate width and freed from the almost universal narrowing of their effective widths by permissive parking, would be reasonably adequate for present traffic needs. But even if parking on the pavements is completely suppressed, existing east and west streets will not be adequate for traffic twenty or even ten years hence.
12. Recognition that complete elimination of car parking on the pavements is not politically possible over-night, nor until a substantial amount of off-street parking is available.

In view of the above, and the many other related considerations, we recommend a system of major streets as indicated on the maps attached. The basic element of our proposals is the introduction into the street system of two limited access arterial roads or expressways, one on the lower level and one on the mountain top, extending across the whole width of the city. Not the least important of our recommendations have to do with the acquirement of the lands essential for the progressive development over a long term of these trunk arteries. Their function is as routes for heavy intra-city traffic, as distributors of inter-urban traffic, and as get-away streets for rush hour and other traffic moving relatively extended distances in volume. A very inadequate alternative would be the much more costly and disturbing widening of existing business streets.

EXPRESSWAYS

Our recommendation envisages these trunk arteries as six-lane roadways wholly or essentially separated from the level of intersecting streets and extending from the extreme west end of the city to its eastern limit. Connection to the street system would be made at intervals not more frequent than one-half mile.

These Expressways may not materialize in complete form for twenty or thirty years, but section by section should be proceeded with year by year. Continuously and at all times, conscious effort must be exerted to protect and ensure their ultimate complete consummation.

A most unusual opportunity exists to provide these primary trunks to the traffic net of Hamilton, in that no buildings of any actual account stand in the path of these improvements which we deem the key to the traffic problem in Hamilton.

For purposes of description, the artery on the lower level is divided into three sections, termed for reference 'The Midtown Expressway', 'The West End Expressway' and 'The East End Expressway'. The Midtown section extends from Dundurn Street to the T.H. & B. Belt Line track at East Bend Avenue. The West End and East End sections lie respectively west and east of the Midtown section. The Midtown section is of primary concern, and this proposal will be described in some detail.

MIDTOWN EXPRESSWAY

It is proposed that from Dundurn Park to Caroline Street, all the properties fronting on the north side of York Street be acquired by the city together with any additional properties necessary to bring under city control a width of 165 feet at minimum and desirably 200 feet from the south side of York Street; that between Caroline Street and Bay Street all the properties from York Street to north of the north street line of Vine Street produced westerly be similarly acquired, and that between Bay Street and MacNab Street all the properties on the south side of Vine Street up to about the middle of the block be similarly acquired.

These lands would be acquired for car-parking purposes, and would be used for that purpose, except for such minor width as it might be necessary to assume for street purposes to provide a six-lane pavement on York and Vine Streets.

In our opinion revenue from parking on these excess lands will carry the cost of acquiring same. At a later date when other parking facilities are available (as for instance four-level open-deck garages on a narrower width of these or other lands), the available width would permit the further widening of the surface roadway and ultimately the construction of a depressed Expressway as and when such was required.

At all times the city would retain ownership of a strip of non-highway land between the new street line wherever established and private properties, so as to create no new frontage along the Expressway. Intersecting streets are so close together that entrances from these streets to any buildings abutting the Expressway would be entirely adequate.

Between Bay and Merrick Streets, York Street to be widened on the north side by at least 20 feet when the existing building is replaced.

Between MacNab Street and John Street, Vine and Gore Streets are widened to 120 feet and the jog between them at James Street eliminated. The necessary lands would be acquired for street purposes, creating frontages on either side. Vine Street would be widened on the south side as would Gore Street east from Hughson Street. Between James and Hughson Streets both street lines of Gore Street would be affected. Through these three blocks the depressed roadway when required would be carried in an underground box structure, possibly with openings for ventilation to a median strip in the roadway above. The street itself would carry six traffic lanes in two roadways as well as ample sidewalks. On this account the depressed roads might be limited to two two-lane channels. While the 120-foot street is much the more costly form of procedure, its use at this location has certain advantages.

Between John and Mary Streets, the wider strip for ultimate needs would be acquired, affecting both sides of Gore Street. The lands acquired would be available for car-parking, except for the minor amounts needed to provide a six-lane pavement.

It should be said that these excess strips do not represent the entire off-street parking program, but

are valuable temporary contributions to it.

Logical locations for junctions of the completed Expressways with the street system, are at Mary Street and Victoria Avenue. It would be advantageous if the sections from Mary Street to Victoria Street including the subway under the Ferguson Avenue track could be completed as a unit at an early date. In any case, the ramp down from Mary Street and the subway under the railway can be completed in final form with temporary ramp roads constructed up the contour of the ultimate slopes, to Wellington Street. The new dual road and subway would be constructed north of the present Wilson Avenue pavement, leaving the latter as a service road to the frontage on the south side of that street. No frontage should be created on the north side.

The completion of this subway and the wider roadway, from Dundurn Street to Wellington Street, would represent the first stage, and continuation of the improvement to Birch Avenue should follow immediately. The procedure would be similar to that adopted on York Street. Between Steven Street and Wentworth Street, the southerly frontage on Wilson Street would be acquired for parking purposes, but elsewhere the north side frontage. Except for the narrow strip necessary to widen existing pavement to 60 or 64 feet, the lands acquired would be used for pay-park purposes hourly, daily and monthly in accordance with determined needs.

With at least a 60-foot pavement along or adjacent to Wilson Street as far as Birch Avenue, this latter street should be improved to give access to the waterfront industrial zone. Traffic to the east end could continue to use Cannon Street, King Street or Dunsmuir Road pending further extension of the Midtown Artery.

Eastward from Birch Avenue, the area traversed by the Expressway is purely residential except at a few intersecting streets. The area is fully developed, and it is likely that little change will occur in the next ten or fifteen years other than the aging of existing buildings.

Several alignments are possible for the Expressways between Birch Avenue and the T.H. & B. track. It would possibly absorb the south side of Fife Street and the north side of Senator Street, and then continue on an alignment to be developed to an undercrossing of the railway track in the line of Roxborough Avenue. Rather than construct a surface road, it would likely be found desirable to at once construct the depressed Expressway to its final form across this stretch.

Even if the T.H. & B. track is elevated in a comprehensive grade separation, Roxborough Avenue would still have to be depressed eight feet or so to underpass the railway. The additional cost of a deeper subway under the conditions applying at this point would not warrant undue delay in the construction of this underpass. If the track were subsequently elevated a few feet a better than standard subway would result.

Pending extension of the Expressway easterly, Glendale Avenue would provide connection to Cannon Street, King Street, etc., and Roxborough Avenue would lead directly east.

As part of the Gage Avenue Tunnel to the Mountain Top, herein proposed for ultimate construction, a connection is proposed from the tunnel roadway to the Expressway at this point, underpassing Main Street, King Street, etc., which would in effect continue this limited access Expressway to Mohawk Road.

EASTEND EXPRESSWAY

Continuing the Midtown Expressway easterly from the T.H. & B. Belt Line crossing, the Eastend Expressway follows the line of Roxborough Avenue for $2\frac{1}{2}$ miles to Woodward Avenue. The frontage on either side of Roxborough Avenue is largely occupied with flankages of properties on the cross streets. When a wider than the existing street is required, it is proposed that one or more of the properties fronting each of the intersecting streets on either side of Roxborough Avenue be acquired as may be necessary to provide a right-of-way of adequate width. A strip of park lands would be reserved on either side, so that no new frontage

would be created. Roxborough Avenue could then be depressed or otherwise converted to an express highway. Junctions with the normal street system would be made at about half mile intervals, in most instances at the original township side lines (Ottawa, Kenilworth, Strathearne, Parkdale, etc.)

At the line of Woodward Avenue, this Eastend Expressway is diverted south-easterly across Redhill Creek to miss Woodlawn Cemetery and meet Highway No. 8 at Nash Road and Highway No. 20 at King Street in Stony Creek. Additional land would be acquired on the west side of Woodward Avenue, and this street brought to a connection with the Queen Elizabeth Way Burlington Beach. Traffic eastbound desiring to reach the Queen Elizabeth Way would do so via a connection at Barton Street, or a connection from Woodward Avenue might be introduced between Burlington Street and the Waterworks Plant joining the Queen Elizabeth Way with separated grade at a point west of the traffic circle. A subway on Woodward Avenue under the Canadian National Railway tracks is assumed.

From the Eastend Expressway, Woodward Avenue is extended southerly to directly connect with the Glendale-Mount Albion Road, and hence to the Mountain Top to the east of King's Forest Ravine.

WEST END EXPRESSWAY

This is a continuation westerly of the Midtown Expressway. A preliminary plan of the junction of Dundurn Street, the Western Entranceway and the Midtown Expressway shows a traffic circle enclosing a circular parkette of 350 feet diameter in which stands a one-way roadway 60 feet or more in width, radiate five streets, about equally spaced, namely Dundurn Street, York Street (the Midtown Expressway), Barton Street, Western Entranceway, and the West End Expressway. This last supersedes Woodbine Crescent, but crosses Jones Avenue slightly west of the present Woodline Crescent. It is suggested that all the tag ends of private properties remaining on the north side of the Expressway be added to the Cemetery or made park lands.

Southerly, from Jones Avenue, the Expressway parallels Breadalbane Street immediately in rear of the properties fronting on the west side of that street, swinging westerly to overcross the T.H. & B. Ry. at Baker Street. It descends along the edge of the High ground to connect with Valley Street at about its intersection with Hunt Street. The grade as far south as the railway is less than 5% but from the overcrossing of the railway to Valley Road a 6% grade may be required depending on the height to which this former marsh land is filled.

From this point the Expressway will follow the Chedoke ravine underpassing King Street, Main Street, Longwood Road and the T.H. & B. main line. It would pass behind the school on Bowman Road, and across the end of Emerson Avenue. From thence, it would follow the general line of the unopened road allowance between Concessions I and II to No. 2 Highway.

Connections to the street system would be made at Tope Crescent, possibly at Main Street, at Aberdeen Avenue (which would be extended via the old radial right-of-way to the expressway), at Stroud Road, at Emerson Avenue, and possibly at Horning Mountain Road. For a good proportion of its length, this expressway would follow the edge of park lands. Every effort should be made to ensure that it develop as a limited access road, providing no frontage to private lands.

From Valley Street connection would be made to Longwood Road at the Coote's Paradise Bridge, and via it to the Guelph Road and the Toronto Highway. Also from this bridge, a boulevard connection is proposed along the edge of the marsh to connect with King's Highway No. 102 to Dundas.

MOHAWK ROAD EXPRESSWAY

As the basic element in the road structure on the mountain top, it is proposed that Mohawk Road (that is the concession road and not the diversion known as Mohawk Trail) be given a width throughout of 165 feet. At two points, namely across Lot 7 and across Lot 18, it already has this width. (This is the width suggested as minimum for the Midtown Expressway). This boulevard would be a major distribution channel on the upper level.

It is at the outlet of the projected Kenilworth Mountain Road, and at the outlet of the Gage Avenue Tunnel. At West 5th Street a similar expressway connects with the outlets of the James Street and Dundurn Tunnel roads, and from Mohawk Road and West 5th Street, a projected expressway leads off to the southwest as a possible route to Brantford and Windsor. Westward from West 5th Street this boulevard Mohawk Expressway following the line of 12th Avenue, would provide an entranceway to the Sanatorium. At its west end a mountain road is projected down the hill to No. 8 Highway, providing connections to Ancaster, West Hamilton and Dundas.

Reference has already been made to the Expressway connection that will be provided by the Gage Avenue Tunnel, when constructed, to the Expressway System on the lower level of the City, which in turn will have direct connection to the limited access highways of the provincial system.

It is altogether likely that for many years ahead, Mohawk Road will have more the character of a parkway, than of a heavy traffic street.

STREET IMPROVEMENTS IN THE DOWNTOWN AREA

A larger Hamilton means an extended central business zone and intensified traffic into and out of it. The following improvements to the central street system are recommended for the reason given under each item.

1. King Street

Between Mary Street and Wellington Street, King Street is of variable width but at no point fully 66 feet wide. Provision should be made for widening this section. King Street will continue to be a main shopping street, with the tendency for the retail zone to extend easterly in the direction of the bulk of the population. We recommend that King Street from Mary Street to Victoria Street be widened to not less than 80 feet (the width of James Street south of King Street) and most desirably to 100 feet, through the

operation of a set-back line as the street is rebuilt, in the manner contemplated in City of Toronto special legislation obtained in 1949.

The provisions of this legislation are given as Schedule XII and it is recommended that Hamilton apply for similar legislation.

In passing it should be noted that the great value of the north side of King Street as a shopping street comes from the sidewalk width and not from the pavement width. King Street at the Gore is definitely a noble street, but its character changes drastically at Mary Street.

In view of the anticipated growth of Hamilton it is, in our opinion, desirable to spread out the business district and overcome the excessive concentration which is a present traffic disability.

This widened King Street would give a desirable outlet from the business section to Victoria Street, which street is 80 feet wide, has good outlet at either end and is one of the traffic assets of Hamilton. It would also bring Wellington Park into the business centre as a feature and breathing spot at its easterly end. The precise location of the rectified street lines cannot be suggested lacking an actual survey of the street. But the jog in the north street line at Mary Street should be eliminated, the south side straightened, and the curve at Wellington Street eased.

2. Mary Street

Except for James and John Streets, there are no streets crossing King Street in the mile between Wellington and Hess Street that are of sufficient width to carry four-lane pavements. This is a primary cause of traffic congestion in the downtown.

Mary Street is 66 feet wide as far south as King William Street but only 30 feet wide between King William and King Streets. It is proposed to widen this section and extend the street at a width of 66 feet southerly the additional two blocks to Jackson Street, providing a continuous alignment throughout, also to widen Jackson Street between Catharine and Walnut Streets. Both

these latter streets have subways under the T.H. & B. tracks. Walnut Street is 66 feet wide from Jackson Street to Foster Street (a block south of Charlton Street) and its subway is the full width of the street. Catharine Street is 66 feet wide or slightly less from Augusta to Charlton Street and 61' 4" wide through the subway. It is proposed to complete the widening of this street from Jackson Street to Augusta Street.

The use of Walnut Street as another entrance to the Mountain Boulevard is proposed to relieve the concentration of traffic on John Street. Mary Street crosses King Street at the easterly end of the gore. It is the most easterly of the group of through streets that overcross the C.N.R. tracks. It is midway between James Street and Wellington Street, and at the western end of the wide portion of King William Street. Relatively little demolition of buildings is required to permit its extension to Jackson Street. Jackson Street in turn has only local traffic value east of Walnut Street. We regard this Mary - Walnut Street extension as of major importance in the easing of the traffic problem both immediately and very definitely in the years ahead.

3. Catharine Street

We have recommended that this street be widened to 66 feet between Augusta Street and Jackson Street in view of the opportunity that exists to do so, and to bring the subway under the railway tracks into greater use. There would remain but four blocks from Jackson Street to Rebecca Street, through which Catharine Street would be narrow (40' wide). The Terminal Building and the Factory building at the north-east corner of Jackson Street are about six feet back from the east street line of Catharine Street, but a width of 46 feet is still inadequate. Widening this street over the years by the operation of a set-back line as it was rebuilt would be of undoubted traffic advantage, but no recommendation is made, in view of more urgent priorities. The Catharine Street subway is the narrowest of the group of four, and the roadways through it are disappointing, being but 16' 7" wide compared to 20' 3" at James Street, 18' 4" at John Street and 18' 1" at Walnut Street.

4. James Street

This very important street is 80 feet wide (or closely so) from Hunter Street to King Street. We recommend that this width be continued to York Street, by the operation of a set-back line on the west side to take effect when rebuilding occurs. The purpose is to open up this bottleneck and to more effectively link King Street and the Gore to the Market Square. For the same reason as applies in the case of Catharine Street, we make no recommendation for the extension of this widening to the Midtown Artery at Vine Street, though the advantage would be obvious.

In the same way to ease traffic at the intersection, the corners of James Street on the north side of King Street should be rounded or levelled from points 12 feet from the corners when these buildings are rebuilt.

Widening the King Street pavement at the expense of Gore Park to permit a direct movement of traffic across James Street, is a matter of traffic detail, as in the widening of the James Street pavement opposite this parkette. Both will probably be found desirable as traffic increases.

The importance given James Street as the entrance to a major mountain road, and the fact that other than Charlton Avenue, no intercepting Streets are continuous across it together with its inherent importance and the ease with which such widening can be accomplished all warrant its widening from the T.H. & B. subway southerly to Aberdeen Street to the width of 86 feet by a set-back line of 10 feet on either side, and this is recommended. The only building of any substantial size affected is the Medical Arts Building. This could be left undisturbed and the sidewalk arcaded within the building. The main need is to obtain six-lane pavement from Young Street southerly.

5. Park Street

This street is 66 feet wide from Barton Street to within 140' of King Street, and we recommend that it be widened to this width to King Street, to

provide better circulation in the market zone, and permit two-way operation to King Street.

6. Bay Street

This street is already and will become increasingly, a most important traffic street. It is in effect the direct extension of Burlington Street, is the most westerly street crossing the C.N.R. tracks, and the most westerly street entirely on high ground. The ground falls off sharply on the west side of Bay Street from Cannon Street northerly.

Bay Street is of the full width of 66 feet, except for the two blocks between King Street and York Street. There are no buildings of account that would delay this widening which should be proceeded with immediately. As well the very sharp reverse curve north of Strachan Street should be eased. The old dwelling which projects into the street and is apparently the cause of the devious alignment, has outlived any importance it had in bygone days.

7. King William Street

This street occupies in relation to King Street, a position analogous to Main Street, and in relation to the Midtown Artery, a position analogous to Cannon Street. It will have an increasing function for turning movements, as well as increasing importance as a business street. With a slight jog at Steven Street, it extends to Wentworth Street. It is 66 feet wide as far west as Mary Street. In our opinion, it should be widened to this width to John Street at an early date, and ultimately, as the street is rebuilt, to James Street. The present width of the street between John Street and James Street ranges from 48 to 49 feet, which could carry a narrow (36') four-lane pavement at some sacrifice of sidewalk widths. Or consideration might be given to the arcading of the sidewalks within the buildings in this last block.

It is however, believed that with the improvement of Vine and Gore Streets, and by strict traffic regulations and complete prohibition of parking on at least one side of King William Street, the present three-lane pavement can be made to serve the needs of traffic on

this street, while the present City Hall continues in use, and while King William Street traffic must be deflected around it.

8. Hunter Street

A rectification line should be laid down on Hunter Street between John Street and Catharine Street, to assure that this street will have the full width of 66 feet when built up. With advantage, the street could be regraded to reduce the sharp summit between the grades into the subways.

9. Victoria Avenue

This street 80 feet wide from Burlington Street to the T.H. & B. tracks is one of the traffic assets of Hamilton. It stands at the easterly edge of the expanded downtown area. Of its four railway crossings in the industrial area, only one would require the slightest modification of grade to permit the street to underpass them above lake level. At its southerly end, Victoria Avenue is carried by subway under the T.H. & B. tracks, but the descent is sharp and rendered hazardous by the Young Street intersection. The diversion of this latter street from its junction with Wellington Street, into a widened Webber Avenue, will improve the traffic value of Victoria Avenue as access to Charlton Street (a cross town thoroughfare) and to the mountain top either at Upper James Street or at Sherman and Crockett Streets.

EAST AND WEST MAJOR STREETS

The few continuous east and west streets below the mountain must manifestly continue as major streets. Certain betterments are needed to improve the continuity of others, and to divert as far as practicable, heavy traffic from purely residential streets. Streets designated as through traffic streets in addition to the Midtown Expressway and its extension, are as follows:

1. Burlington Street

The difficulties of grade-separating the

railway tracks across Burlington Street prevent any dependence being placed on this street as an artery for through traffic. But it is bound to have intensive use as a marginal way providing distribution facilities to the industries fronting it, and should for this reason be widened to at least 86 feet to carry a six-lane pavement.

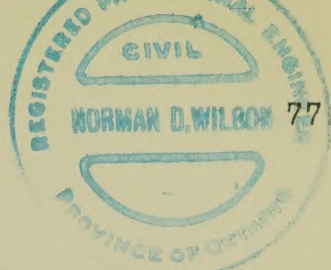
In any development of the western end of the harbour, Burlington Street between James Street and Bay Street should be extended south-westerly to the edge of railway lands, and follow some five feet or so above high water level to link up with the Plains Road, and with the Guelph Road at the Desjardins Canal.

2. Beach Road

Beach Road provides the easterly extension of Burlington Street, and eastward from their junction should be widened and paved to the same standard. It is proposed that Beach Road at Kenilworth Avenue be closed across the railway tracks, and the east and west sections diverted to outlets via Stapleton Street. Beach Road traffic eastbound would be diverted via Gertrude Street, Kenilworth Avenue (where a high level bridge over the tracks is proposed) and Burlington Street and westbound traffic vice versa. This would provide a grade-separated outlet for Ottawa Street. The T.H. & B. crossing of Beach Road west of Ottawa Street is particularly dangerous, and an overhead bridge carrying the highway over the railway must ultimately be constructed.

3. Barton Street

This concession road allowance has been a major street from the earliest days of the city, and will continue to be such. It is of very miscellaneous development being in part residential, retail business, industrial and institutional with public buildings such as jail, general hospital, etc. Essentially it is a business and distribution street, rather than a traffic artery. On the zoning plan it stands as the general limit between the industrial area and the residential area, and is the shopping street serving both. It is not available to be given over to high speed through traffic. It has adequate width to carry a four-lane pavement.



Aside from its two railway grade crossings at Ferguson Avenue and Kensington Avenue, it suffers from a jog at James Street, and a very heavy grade immediately west of Bay Street. It comes to an abrupt end at Locke Street.

In view of the general importance of this street, it is proposed that the jog at James Street be eliminated by cutting off the northeast corner, and that the street be extended to Dundurn Street.

The chief disability of this street is the very steep descent on the west side of Bay Street. The grade is about 11% and the loss in height fully 30 feet. It must then rise 100 feet to Dundurn Street. The grade at Bay Street is prohibitive to eastbound truck traffic. It could be modified by the construction of a steel structure from Bay Street to Hess Street overcrossing the railway siding on Caroline Street, and this may sometime be found warranted.

It would be possible to divert Barton Street at Queen Street to a new alignment passing north of Dundurn Castle, but the more direct route to the Western Entrance Parkway is preferred.

4. Cannon Street

Cannon Street continues as a major service and distributor street to the light industrial zones between Barton Street and the Central Downtown. Its utility as a through street is seriously affected by the ten level crossings at the C.N.R. L.C.L. yard at Ferguson Avenue. The cost of the grade separation of these tracks would be in our opinion, out of proportion to any likely increase in the utility of this street as a through traffic artery. As well this street is needed and will be fully utilized as a service street, as the area on either side becomes more and more industrialized.

Cannon Street is well dotted with industrial plants and any sufficient widening to fit it as a dual-purpose street does not appear economic. Nor does the grade separation of these tracks across Cannon Street appear likely at any sufficiently early date as to warrant making such an essential element in a major street

plan, even though it forms an integral part of said plan.

5. King Street

King Street is also, from its continuous alignment, its historic place and present use, very definitely a major street. It has adequate width throughout to carry a four-lane pavement.

A recommendation has already been made for its betterment in the Downtown area.

Dundas and the area surrounding it are bound to grow and develop. King Street is the logical access to downtown for this part of the metropolitan zone, and its extension to the Dundas Highway should be provided for.

At its east end, King Street is the main street of Stoney Creek. It merges with Lawrence Road at its junction with the Glendale - Mount Albion Road. Provision should be made for widening King Street to 100 feet from this point easterly to Highway No. 20.

6. Main Street

Main Street continues as a main traffic artery without widening or other material modification over its major extent. Where opportunity exists to widen it under the provisions of the Planning Act, such should be done. Owing to the extreme fewness of streets traversing West Hamilton, and the importance present and future, of the traffic routes through Dundas and Ancaster, Main Street should be widened or a set-back maintained from Dundurn Street to the Ancaster - Dundas fork in Lot 54. The widening of Main Street to 100 ft. has already been accomplished across Chedoke Ravine, and this widening should be continued westerly.

7. Young-Cumberland-Lawrence Road

The development of a miscellaneous traffic street leading easterly from the central zone and located immediately north of the T.H. & B. Railway, is recommended. This would skirt the residential area, act as a feeder to it, and preserve it from unnecessary intrusion of heavy traffic. It would also serve as a distributor

and service street for the industries situated along the railway line. It is proposed that Young Street be improved easterly from the subway under the T.H. & B. tracks by a minor diversion, extending it via Webber Avenue and Alanson Street into Cumberland Avenue. The connection of Cumberland Avenue with Lawrence Road at Gage Avenue would be bettered and Lawrence Avenue improved by regrading where desirable and by widening as necessary between Ottawa Street and Houghton Avenue to allow for the proposed Mountain Boulevard Bridge. From its present terminus east of Strathearne Avenue, Lawrence Road would be extended via the former radial railway right-of-way to meet King Street at King's Forest Ravine. The development of a street 80 or 86 feet wide capable of carrying a 60-foot pavement, should be the objective, to be ever kept in mind.

8. Charlton Avenue

In some degree complementary to the Young Street - Lawrence Avenue artery, Charlton Avenue is recommended for adoption as a major through street from Wentworth Street to Dundurn Street. Minor improvements in alignment and the early paving of this street are proposed between Walnut Street and Wentworth Street, where a bridge over the two railways is a matter that should have early priority. Caroline Street and Walnut Street provide good inter-connection with Young Street, so that turning movements at James and John Street can be minimized.

Where Charlton Avenue traverses areas zoned for industry (east of Ferguson Avenue), provision should be made for its widening now. Elsewhere building lines should be established to permit an eventual six-lane pavement without sacrifice of the amenity of the street.

9. Aberdeen Avenue

This is now a major traffic street, at any rate west of Queen Street. This status will continue.

It is proposed to extend Aberdeen Avenue westerly via the former radial right-of-way, to a junction in the Chedoke Valley with the West End Expressway.

Minor changes are proposed at the junction of Aberdeen Avenue with the James Street Mountain Road in connection with the proposed James Street Mountain Access Tunnel. There would be no direct connection from Aberdeen Avenue to this tunnel. Charlton Avenue is proposed as the access from the west to this mountain access tunnel.

10. Concession Street

On this street, at no point more than 700 feet from the brow of the mountain, is located the main business area on the mountain. Notwithstanding that Concession Street will always be strictly a local business and distributor street, as it lies at right angles to any likely through traffic movement, the permanence of this local business centre seems secure. This will be further assured when, with the improvements proposed for the Jolley Cut grade, local traffic will find it convenient to travel via Concession Street at all seasons of the year.

The outlet of Mountain Boulevard at Crockett Street is but 700 feet from Concession Street. With the improvements proposed, this will be the outlet for traffic ascending the mountain from points as widely distributed as Walnut Street, Victoria Avenue, Wentworth Street and Graham Street.

11. Queensdale Avenue

Topographic considerations combine to place this street in the category of a through distributor street for purely local traffic, including transit service. As closely as may be it bisects the present built up area on the mountain. It would seem desirable to fill in the gap in this street between Sherman Avenue and East 33rd Street, and to extend it with continuous alignment to the head of Flock Road.

12. Fennel Avenue, etc.

All the concession roads in original Barton Township are classified as major streets, namely Fennel Avenue, Mohawk Road, Lime Ridge Road, Stone Church Road and that occupied by Highway No. 53.

All of these, when adjoining lands are subdivided, should be widened to 86 feet under the provisions of The Planning Act. Lime Ridge Road should be extended westerly to meet the road between Concessions II and III Ancaster. The special place of Mohawk Road has already been referred to.

13. Central Avenue

Not included in our category of major streets, but having latent value as an emergency alternative east and west street, is Central Avenue. It extends from east of Strathearne Avenue to within one block of Ottawa Street. It could be extended without difficulty to King and Ottawa Streets, and this should be done.

NORTH AND SOUTH MAJOR STREETS

All the original township side-road allowances, with possibly one exception, are classed as major streets. This is in accordance with popular acceptance, due to their historic position and the fact that they are straight and open across all railways. Only two or three other streets are included in this category.

1. Queen Street

This street has direct access to the mountain by Becketts Drive. North of York Street it drops 60 feet by any grade to near lake level, and has an acceptable outlet to Bay Street via Stuart Street. It is more a distribution street than a through street. Its width of 66 feet should be protected from encroachments.

2. Dundurn Street

This is definitely a major artery directly connecting with the Western Entranceway, and is designed in the herein plan, as a by-pass for heavy traffic from the north shore to the mountain top. Some results have been obtained to efforts by The Planning Board to widen this street. It is recommended that building setback lines be established on this street to widen it over the years to not less than 76 feet and desirably to 86 feet or sufficient to permit it to carry a six-

lane pavement. The fact that such widening may not seem economically possible at one or two points should not stand in the way of widening the balance of the street, leaving but the few points to be cleaned up when the need makes it economic to do so.

There is a sudden bump in the grade of this street south of Aberdeen Avenue, which should be removed by regrading the street from Aberdeen Avenue to Glenside Avenue.

Other than this the grade of Dundurn Street is relatively uniform and easy. Between South Street and Hillcrest Avenue the grade reaches a maximum of 4.75%.

3. Longwood Road

While Paradise Road is the township side line, it has been diverted at either end into Longwood Road, which has become the accepted major street. It is an alternative entrance into Hamilton from the north shore, particularly for through traffic to the west. The construction of the West End Expressway in the Chedoke ravine should remove some of the through traffic from this street.

4. Emerson Street

The only township side line of Ancaster Township below the mountain that is open in whole or part in West Hamilton is the northerly part of the Horning Mountain Road. Emerson Street has developed as the major cross street in the area, and is adopted as such in the herein plan. Its extension easterly up the mountain side to Fennel Avenue possibly a generation hence is suggested.

5. Wellington Street

This heavily travelled street is not open across the T.H. & B. Railway, and presents a difficult grade separation problem at its northerly end, as such entails a comprehensive rearrangement of the tracks of both railway companies. It is however a very important street in its central portion, particularly as, on

account of the railway intersections on Cannon Street. a large part of the traffic to and from the east end via that street is routed via Wellington Street.

6. Wentworth Street

This street is another important midtown street of mixed character - residential, educational and industrial. It intersects the waterfront industrial district toward its westerly end. As well, it is not far west (1600 feet) from Birch Avenue which street, being completely grade-separated, will always be one of the main entrances to that district. This is important as the industrial switching yards of the Canadian National Railways are located across Wentworth Street, and there are major difficulties of grade separation at these tracks, at the T.H. & B. Spur line and at the Canadian National Main lines.

The southerly outlet to Charlton Avenue over the T.H. & B. Railway and the C.N.R. Port Dover Branch is very bad with level crossings on a grade of the order of 12%. A proper outlet across these railways and to the mountain top is required, and an overhead bridge is proposed. To rise over both railways with full railway clearance, 1000 feet of structure with approaches is required; this, starting from opposite Rutherford Avenue, over-crosses Alanson Street and the two railways to meet Charlton Street a little east of the entrance to Charlton Hill. We recommend that this bridge be given high priority.

7. Sherman Avenue

This street below the mountain is a general all-purpose cross street. It is intersected by railway tracks in the industrial district at 5 distinct points. It has a small business area in the same zone.

8. Gage Avenue

This is another feeder street to the Industrial zone. As well, it is industrialized at its south end opposite Gage Park. A bridge and tunnel up the mountain debouching at Mohawk Road is proposed for ultimate construction. Entrance from Gage Avenue would be at Maple Avenue.

9. Ottawa Street

Ottawa Street is an important retail street from Barton Street to Roxborough Street. As well as being an important entrance to the industrial area, it is the chief connection to Beach Road and thence via Burlington Beach to the north shore. As previously stated it is proposed to divert Beach Road traffic via Gertrude Street to a bridge on Kenilworth Avenue over the railway tracks.

At its southerly end Ottawa Street has connection, by a level crossing over the T.H. & B. tracks and a series of hairpin turns and 7% grades, to the Mountain Boulevard and thence to the mountain top either at Sherman Avenue and Crockett Street or via the Flock Road to Concession Street.

The steepness of the mountain at Ottawa Street renders it impossible to make a direct descent to Ottawa Street and provide grade separation. Accordingly, it is proposed to continue the Mountain Boulevard easterly, by a bridge over the T.H. & B. Railway, along the south side of a widened Lawrence Road to ground level at Graham Street, using that street and King Street to reach Ottawa Street.

10. Kenilworth Avenue

This street has an important place in the major street plan. There is already existing a subway underneath the main line of the C.N.R., and a bridge over the T.H. & B. and C.N.R. industrial spurs is herein proposed. At least a 5% grade rising from Gertrude Street will be required.

A subway under the T.H. & B. main line tracks at Lawrence Road is proposed, connecting with a road up the side of King's Forest Ravine to the mountain top at Mohawk Road.

The widening of Kenilworth Avenue to 86 feet from Lawrence Road at least as far south as Roxborough Street, is proposed. Where the street is built out to the present street line, this widening to be done over the years as the buildings are rebuilt, through the

operation of a set-back line. The regrading of this street north from King Street to not less than a 45 grade is also essential. No buildings of account are affected on the west side of the street, while any detriment to the school on the east side would be minor.

11. Strathearne Avenue

This street is not open south of Main Street, and is definitely closed at King Street and occupied by a cemetery; nor is it as yet open across the Canadian National Railway. It is paralleled from Beach Road to King's Forest Park by a Hydro Electric Power Line Right-of-Way.

This street will presumably be opened up in course of time from Beach Road to No. 8 Highway. From this point south it is proposed that Cochrane Street be developed as the major street into the residential areas traversed, and as the entrance to King's Forest Park. King Street follows the crest of a narrow moraine; and it is proposed that Cochrane Street underpass it, as well as the T.H. & B. railway farther south.

12. Parkdale Avenue

This Township side line promises to be one of the most important arteries in Hamilton. It traverses virtually flat ground falling gently from a possible junction with the Glendale - Mount Albion Road in the line of Mohawk Road, to Beach Road $3\frac{1}{2}$ miles to the north, with every likelihood of eventual extension another mile across industrial lands to be created by filling in the bay, to the Burlington Beach Road.

To some extent this street has been, or can be, widened 10 feet on either side under the provisions of the Planning Act as subdivision plans are registered. Provision should be made for widening this street throughout its extent to 86 feet. From Beach Road north-erly it will form an extension of the Burlington Street - Beach Road Marginal Way.

A subway under the C.N.R. tracks is certain at

some future date. Provision could well be made for a road from the northerly end of this subway following the waterworks pipe line to Woodward Avenue. This road might well be 86 feet wide and should be kept free of railway crossings.

13. Woodward Avenue

Woodward Avenue north of Roxborough Avenue is developed as part of the Eastend Expressway. South of Roxborough Avenue, Woodward Avenue is diverted into the King's Forest Ravine, passing under Highway No. 8 and connecting with the Glendale - Mount Albion Road at King Street. This is bound to become an important by-pass road from the North Shore to the Mountain Top.

14. Nash Road

East of the King's Forest Ravine, the trend of traffic will be essentially east and west, and the north and south roads can be sufficiently protected by the operation of the subdivision provisions of the Planning Act.

15. Birch Avenue

One major street of importance incidentally referred to above is Birch Avenue. When street railway service is abandoned the Radial Railway Right-of-Way should be taken over for highway purposes, and a dual highway constructed from Burlington Street to the Mid-town Expressway at Wilson Avenue.

This fully grade-separated entrance to the Industrial District should not be lost or narrowed down to the present Birch Avenue. The full width of Birch Avenue and the right-of-way combined should be retained for highway purposes, and a better junction obtained at Burlington Street for traffic moving north and west, or east and south. If this right-of-way is made available for highway purposes, grade separation at Wentworth Street and Sherman Avenue can be postponed for some considerable time.

The sub-station erected on the radial right-of-way leaves a space, including Birch Avenue, about

84 feet wide, available for highway purposes. This is narrower than is desirable but would carry a 60-foot pavement at a pinch.

16. Locke Street

This street, while not an original road allowance, has, between Aberdeen Avenue and Main Street, developed into an important local shopping street. It is midway between Queen Street and Dundurn Street, and is the only street between them that is continuous across York Street, or even between Main and Aberdeen Streets. It extends from Barton Street to Aberdeen Avenue. While of good width (66 feet or thereabouts) south from Main Street and north from King Street, it is very narrow between Main Street and King Street and is badly in need of rejuvenation. It is recommended that this section be widened to 66 feet, through the operation of building set-back lines as the street is rebuilt.

17. Township Sideroads on Mountain

All the original sideroads of Barton Township, from and including Ottawa Street to and including 30th Street (Paradise Road) are included in the category of major streets. All of these streets should be widened to 86 feet under the provision of the Planning Act, when abutting lands are subdivided. Their relation to the proposed mountain access roads will be outlined under that heading.

18. 'Glandford' Road

One additional road is proposed to be developed as the land is subdivided. This is the extension northerly of the County Road between Lots 13 and 14 in Glanford Township. This is extended northerly about parallel to the railway to Lime Ridge Road, then along the lot line between Lots 2 and 3, (the west limit of park lands), to Mohawk Road and then north-westerly along the general line of the Mountain Drain to Fennel Avenue. From this intersection a secondary road is suggested running north parallel to Ottawa Street to the head of Flock Road.

E. MOUNTAIN ACCESS ROADS -

On the assumption that when Hamilton reaches a population of 500,000, 40% of this population will reside on the mountain top, but that most workers will find their employment on the lower terrace, it is imperative that adequate means of access be provided between the two levels of the city, both as regards the number and spacing of these roads, and their capacity for traffic under all conditions of weather. (1)

Fundamental to all consideration of mountain access is recognition that the distance from a point on the brow of the mountain to a point at the foot directly below, instead of being 800 feet as a flat plan indicates, is at least 5 times that in actual road distance of travel, and might readily be 15 times that distance depending on whether the road hairpinned up the mountain on a 6% grade or tunnelled up in a straight line at 4% grade to debouch a mile back from the brow.

On the other hand to a person at Mohawk Road or south of it, the direct tunnel line would be the shortest, and the hairpin route up the mountain face represent a half mile of extra distance. But as yet there are no citizens of Hamilton living as far south as Mohawk Road, nor indeed any south of Fennel Avenue.

We conclude that a direct tunnel up the mountain is, altogether aside from the great cost involved, not the immediate solution. (2)

We also conclude that in view of the difficulties and delays experienced at the Arkledun Avenue hairpin turn, that roads with hairpin turns do not present a practical solution. (3)

Of all streets reaching the foot of the mountain, James Street attains the highest elevation with the minimum grade. It reaches elevation 405 about 150 feet south of Markland Street, without exceeding a $5\frac{1}{4}\%$ grade of approach. John Street reaches elevation 413.1 at Arkledun Avenue, but the grade of approach reaches 9.2% immediately north of the

Mountain Boulevard and Arkledun Avenue. It averages 7.44% in the 635 feet from Charlton Avenue to Arkledun Avenue.

The top of the mountain at James Street and at West 5th Street is at elevation 625; and at Concession Street and Wellington Street at elevation 640.

This rise of 210 to 220 feet at this location is the minimum found at any point along the mountain face. (4)

In comparison Wentworth Street at Cumberland Avenue is at elevation 326; at Concession Street 643, or a rise of 317 feet. Ottawa Street at Lawrence Road is at elevation 353; at Mountain Brow Road 633, or a rise of 280 feet.

This is the explanation of the number of Mountain roads commencing at James and John Streets, as it is also one reason why the city centre is at James Street.

In view of the above four numbered conclusions, and of traffic considerations cited elsewhere in the report, we recommend a program of the following 14 access roads to the mountain. In general, these roads are intended to be limited access roads providing no frontage to adjoining lands, and wholly free of intersections. Their capacity per traffic lane will hence be more than double that of a traffic lane on a normal city street. Accordingly, all are proposed as two-lane roadways only, but of sufficient width to permit traffic to pass a stranded vehicle. Where frontage exists as on Arkledun Avenue, or is possible, as on Charlton Avenue or the Mountain Boulevard at Ottawa Street, or where dual outlets are proposed, four lanes are contemplated.

As the alterations contemplated for the Arkledun Avenue - Claremont Hill Road can hardly be carried out without closing this hill to traffic for a few weeks at least, and as this route is already carrying to capacity, it is apparent that, if present congestion is to be reduced, a completely new road is called for as the first complete step in the general program, which is as follows:

1. James - Queensdale Access Road.

This is a completely new road up the mountain, of high standard of construction, easy radius of curvature (400'), and low gradient (compensated 5%). It in no way affects nor interferes with the present James Street Mountain Road which would be continued in service unaltered.

This road commences 150 feet south of Markland Street, and will be a direct production of James Street. It bends westerly through the terminal of the old incline railway, and entering tunnel passes under the old reservoir, under the James Street Mountain Road, under the rear yards of the houses on Inglewood Drive, and emerges on the hillside at a point slightly east of the line of Bay Street. The road continues up the hillside at a point slightly east of the line of Bay Street. The road continues up the hillside clearing the Ravenscliffe properties, and curving left on a 400 foot radius enters the ravine in front of the Ontario Hospital. It enters tunnel again when forty feet or so below the mountain level, passing under the approach driveway to the Hospital from West 5th Street, and the surrounding park area, and reaches the surface at West 5th Street opposite Brantdale Avenue. Local traffic would follow Brantdale Avenue to West 2nd Street, from which corner a new street is projected diagonally across the block to connect with Queensdale Avenue at Upper James Street.

From the south limit of Markland Street to the west limit of West 5th Street at Brantdale Avenue, the distance is 5,000 feet, and the rise about 244 feet. This alignment provides minimum climb, a grade not in excess of 5%, and outlet on the mountain as close as possible to the mountain brow. The distance from James Street and Mountain Boulevard via this proposed road to a point directly south at Queensdale Avenue is 6,900 feet; that from John Street and Mountain Boulevard to a point directly south of Inverness Street via Arkledun Avenue and Claremont Hill is 5,400 feet. The grade is reduced from a 6% grade on Arkledun Avenue (aside from the heavy grade on John Street) to the 5% maximum on the projected James Street Road. The extra distance represents 52 seconds of travel time at 20 miles per hour along Brantdale Avenue.

The two stretches of shallow tunnel or covered cut are respectively 1,150 feet and 600 feet long. Artificial ventilation should not be necessary. If needed, shafts to the open air can be constructed, as nowhere is the road level more than 40 feet below the ground level.

This proposal will necessitate moving the lower end of the James Street Mountain Road slightly to the west. Down-bound traffic on the Mountain Road as well as that from Aberdeen Avenue would be routed over the tunnel at Aberdeen Street, making the descent to James Street on the east side of the tunnel portal to avoid traffic conflict. The south-bound approach to Aberdeen Avenue could be appreciably eased.

There would be no provision for sidewalks on this project other than for emergency catwalks in the tunnels.

2. Arkledun-Jolley Cut Access Road

This proposal involves the elimination of the hairpin turn and the reduction of the grade on the Jolley Cut to a possible 5%. Arkledun Avenue is made a four-lane street, as it provides frontage for buildings on either side, but its grade of 6% is not altered, nor are the 7% to 10% approach grades on John Street. These are now frozen in to building development.

At the intersection of Claremont Hill, Arkledun Avenue is thrown slightly south against the mountain face to permit the Claremont Hill Road to overpass it and continue easterly to connect with Charlton Hill. Immediate construction of a two-lane roadway from the end of Arkledun Avenue is adequate as no building frontage is contemplated on the improved Jolley Cut Road. An expansion in the roadway to permit delivery vehicles or residents' cars to turn at the end of Arkledun Avenue is provided.

The Jolley Cut Road would be given a grade of 5%, by extending its length through a wide reverse curve of 250' radius and bringing it to the intersection of Wellington and Concession Streets. (The existing road has a grade of 11.55% at maximum point.)

By bringing the mountain road to Wellington Street there would be provided a clear get-away for heavy through-traffic routed to Highway No. 6.

The rise from John Street and Arkledun Avenue to Concession and Wellington Streets is 227 feet, and the distance 4,500 feet.

One of the present disabilities of the Arkledun Avenue route is the cross traffic at John Street and Mountain Boulevard which necessitates vehicles stopping on the heavy grade of John Street. To reduce this disability, a new entrance to the Mountain Boulevard is proposed at Walnut Street, while the use of the Mountain Boulevard as a by-pass road avoiding the congested centre of the city will be discouraged by the improvement of Charlton Avenue and Young Street.

It would be possible to depress Mountain Boulevard to pass under John Street. This would not ease the John Street grade but would avoid the necessity of a forced stop at Mountain Boulevard. There is however a substantial number of turning movements at this intersection, which must be considered.

The reduction of grade on Jolley Cut could be accomplished without affecting the use of Arkledun Avenue and Claremont Hill but this in itself would add nothing to the capacity of the Arkledun Avenue - John Street throat. During the progress of work all traffic would have to be routed via Claremont Hill. However on completion all traffic could use the improved Jolley Cut road and be free of the difficulties of the hairpin. Amending the alignment of Claremont Hill and Arkledun Avenue at the present hairpin turn would necessitate the closing of Claremont Hill, and probably of Arkledun Avenue for shorter or longer periods.

A further development of the Jolley Cut road is possible as a later stage. Two additional traffic lanes would be added to the two-lane road from the end of Arkledun Avenue to where the road turns south into the old quarry. Here the two outer lanes would diverge from the centre ones, the upbound lane with slackened

grade would pass under the two-lane Wellington Street road, and, with the downbound lane, would enter tunnel under Alpine Avenue to debouch to the surface immediately west of Wentworth Street, Alpine Avenue being widened to allow for the portal.

In view of the considerable additional cost involved (of the order of a million dollars) this work is given low priority. We do, however, recommend that, in regrading the road up the mountain side from the end of Arkledun Avenue to the quarry - a distance of a quarter of a mile, the roadbed be graded of sufficient width for a four-lane pavement, but only a two-lane pavement need be constructed initially.

3. Walnut Street Access to Mountain Boulevard.

Walnut Street is 66 feet wide southerly from Jackson Street, and is proposed as the desirable extension of Mary Street. The subway on Walnut Street under the T.H. & B. tracks is fully the equivalent of the John Street subway. Walnut Street rises on a relatively easy grade, not exceeding 4.5% to Charlton Avenue where elevation 336.6 is reached.

The proposed new road, of two lanes only, starts at Charlton Avenue and, rising on a 6% grade, follows Walnut Street to Foster Street, then swings easterly passing well south of the Ferguson Avenue Pumping Station and joins Mountain Boulevard just east of the line of Wellington Street, a length of 1,600 feet in all. The intersection with Mountain Boulevard and Charlton Hill is grade separated. The Walnut Street connection divides into up and down lanes which separately underpass Mountain Boulevard at its connection with Charlton Hill, to join the Boulevard on either side avoiding all traffic conflict other than for merging traffic.

This road is designed to relieve John and James Streets of traffic destined for Mountain Boulevard, as well as give an entrance via Charlton Avenue for west end traffic destined for Crockett Street. Cross traffic on Charlton Avenue across James and John Streets where grades are less than at the Mountain Boulevard crossing is less likely to create congestion.

The Walnut Street extension also provides an exit from the east end of the Central business district to the Sherman Avenue exit on the Mountain.

4. Wentworth Street Bridge.

This is a major improvement which in our opinion should be given high priority. It is the eastern inlet to an improved Charlton Avenue, which extends to Dundurn Street. It provides improved and safe access to Mountain Boulevard and by it to the mountain top at Sherman Avenue and Crockett Street. By the proposed link with Claremont Hill it will also provide access to the mountain top at Upper James Street.

Starting at Wentworth and Rutherford Streets this bridge with its approaches extends south-westerly to a point on Charlton Avenue about 800 feet west of Wentworth Street. It rises on a $6\frac{1}{4}$ per cent grade as is necessary to overcross both railways with standard 22'-6" clearance. Full 14 foot clearance is provided at the intersection of Alanson Street and Grant Street. The length of the project is 1000 feet of which 500 feet is steel or concrete structure and the balance earth fill. The removal of about 18 bungalows will be necessary which, as well, provides right-of-way for the extension of Alanson Street into Cumberland Avenue.

This bridge is proposed as a four lane highway with sidewalk on either side. Charlton Avenue will be lowered about 5 feet where the bridge approach meets it. This street is as yet unpaved, and some realignment of it is desirable to make a proper connection with the road from Claremont Hill.

5. Charlton Hill - Claremont Hill.

This project links together the existing Claremont Hill with a relocated Charlton Hill. The grade on Charlton Hill remains $5\frac{1}{2}\%$, but from the crossing of Arkledun Avenue to Charlton Avenue the grade can be kept to 5%. Direct connection is made from Upper James Street to Charlton Avenue to Victoria Avenue and Walnut Street, so providing direct access from the west end of the mountain zone to the industrial area and to the east end of the business area.



As well, connections from Victoria Avenue and Wentworth Street to Mountain Boulevard and the mountain level at Sherman Avenue and Crockett Street is retained and much improved.

Claremont Hill is retained with incidental improvement to within 300 feet of the present hairpin, when this road is deflected northerly and carried over the Jolley Cut Road, continuing on structure parallel the latter 150 feet or so until sidehill support is obtained. It works down the hill and underpasses Mountain Boulevard about opposite Victoria Avenue (an alternative over crossing is possible) and continues the descent on a new alignment (slightly east of the present Charlton Hill Road) leading directly to the Wentworth Bridge.

The existing Charlton Hill hairpin connection to the Boulevard is retained as existing, as is part of the present Charlton Hill Road. Opposite Victoria Avenue this roadway will split into its respective lanes. The downbound lane will pass underneath the new Charlton Hill Road, so that the two lanes from the boulevard will merge with the road from Claremont Hill without traffic conflict. From this point to Charlton Avenue, the new road will be of four-lane width as will also Charlton Avenue and Wentworth Bridge. Charlton Hill meets Charlton Avenue as realigned in a normal T intersection.

From the top of the mountain at Upper James Street to Wentworth Street at Rutherford Street is exactly $1\frac{1}{4}$ miles. The total descent from Bulls Lane to Rutherford Street is 289 feet. This represents an average grade of 4.38%, with 5.5% grade as maximum.

6. Mountain Boulevard.

Connections to Mountain Boulevard will continue at James Street and John Street, though it is hoped that the use of these entrances will be curtailed. A new entrance and exit is provided at Walnut Street, and much improved connections from Victoria Avenue and Wentworth Street. From all these entrances outlet can be had at Sherman Avenue and Crockett Street, to Flock Road or to Lawrence Road. Outlet for traffic from James and Jogn Streets will still be provided to Wentworth Street and

Victoria Avenue, but not to Walnut Street. As stated it is hoped that by-pass traffic can be induced to travel by Charlton Avenue or Young Street.

No material change is proposed to Mountain Boulevard at Sherman Avenue. Protection of a traffic light at the outlet of the rock cut may be required at some early date. As well, a larger plaza at Crockett Street should be provided. Consistent general improvement to these mountain roadways is assumed to be made from time to time.

7. Lawrence Road Mountain Access.

The eastern entrance to Mountain Boulevard is unsatisfactory, and the level crossings of the T.H. & B. Railway and the C.N.R. Port Dover Branch represent real elements of danger. Lawrence Road at Ottawa Street and the adjacent T.H. & B. Railway hug the very foot of the mountain. The first terrace is 70 feet above the railway tracks, and distance is not available to negotiate the descent to Ottawa Street in other way than is now done. The existing road makes a double hairpin turn on a continuous 7% grade, and crosses the railway on a level crossing. Immediately to the west are the clay pits and brick-yards of the Hamilton Pressed Brick Company occupying all the area between the two railways. To the east, again occupying all the area between the two railways, is the existing waterworks reservoir, and a site reserved for a new reservoir, and quite limited in size for that purpose. Other than for this it would be possible to extend the boulevard on a descending grade to an exit at Kenilworth Avenue. Such outlet has disadvantages from the traffic view-point.

From the existing boulevard at a point in the line of Ottawa Street, descent can be made on a 5.4% grade to the level of Lawrence Road at the west side of Graham Street, the railway being overcrossed with standard clearance at the head of Edgemont Street. This arrangement is recommended. Graham Street is midway between Ottawa Street and Kenilworth Street. Connection can be made to Ottawa Street via Graham Street and King Street. Graham Street has a short stretch (150 feet) of 7% grade but otherwise the grade is less than 5%.

The extra distance to be travelled from that now travelled from the intersection of Ottawa and King Streets to the boulevard in the line of Ottawa Street is 1035 feet. This notwithstanding that Graham Street is 1350 feet east of Ottawa Street. This bridge would also provide good connection from Kenilworth Avenue to the mountain top.

To provide room for a bridge structure on Lawrence Road, the street must be widened. As it happens this section of Lawrence Road from Ottawa Street to Graham Street is only 50 feet wide and must be widened in any event if Lawrence Road is to be developed as a major artery. Some 24 properties would be required to provide the minimum width of 66 feet, to the north of a four lane bridge structure. These properties have a total assessment of \$70,000.

The east end of Mountain Boulevard has another disability. Seven hundred and fifty feet west of the line of Ottawa Street is a grade crossing of the Canadian National Railway. Nine hundred feet west of this again, and 35 feet higher, is the hairpin, but reasonably adequate entrance to Flock Road. By the use of a 5% descending grade from Flock Road intersection and with a minor change in alignment of Mountain Boulevard, an undercrossing of the C.N.R. track can be obtained when such appears warranted.

A four lane road is proposed from Lawrence Road over the bridge and through the subway to Flock Road where traffic would have two alternative routes to the mountain top. This section of road would also provide access to the waterworks property.

8. Flock Road

No major change is proposed in this road. It is assumed that it will be widened and otherwise improved by maintenance operations from year to year. Its present overall grade of 6.6% is not sufficiently heavy to warrant its reconstruction at this time. Its connection with Mountain Boulevard is good and is not likely to be altered. Any extension of the road to reduce the grade will hence entail moving its upper

outlet further east, and this can only be done on structure or by the use of high retaining walls.

9. Kenilworth Avenue Mountain Access

A very real opportunity exists to develop a road up the side of King's Forest Park. A 4-1/4% grade is possible. It is proposed to carry Kenilworth Avenue directly south by subway under the T.H. & B. tracks, bending it south-easterly across the clay pits and southerly along the contour of a rising 4-1/4% grade. Kenilworth Drive north of Montrose Avenue would be superseded. The mountain road proper would start at Montrose Avenue, ascend the hill on a developed 4-1/4% compensated grade and reach the mountain top at Mohawk Road, which will be the main outlet for traffic to the west and southwest.

The elevation of the T.H. & B. track, which is about 10 feet above Lawrence Road is 364.7. Ground level at Mohawk Road is about elevation 620. The road would rise 273 feet in 6600 feet -- an average of 4.14%. Every effort should be made to protect the right-of-way for this road, pending its date of construction.

10. Gage Avenue Tunnel

This project calls for the construction of a tunnel on a grade of 4.5% on the general line of Gage Avenue. To keep the south portal as far to the north as possible, the ascent commences 300 feet south of Maple Avenue. The road is carried by bridge over the T.H. & B. tracks, and then enters tunnel to pass under the C.N.R. track. Gage Avenue is the farthest point west where the T.H. & B. tracks can be overcrossed and the C.N.R. tracks undercrossed without a break in the road grade, and it is the elevation of these tracks that governs the northern end of the ascent. Even with this optimum condition, mountain level cannot be reached north of Mohawk Road, with the use of a 4% grade. A 4.1% grade is necessary to bring the top of the grade 200 feet north of that cross artery. The total rise is from about elevation 316 to elevation 672.5, or 356-1/2 feet. The total length of the ascent is 8500 feet of which 5900 is in tunnel.

While a 5% grade would emerge at a point 1000 feet south of Fennel Avenue, shortening the grade by 2200 feet and the tunnel by 1500 feet, the first cost of a tunnel including ventilating equipment as well as annual costs of operation and policing, do not warrant tunnel construction at other than the highest standards of grade and other operating factors. In view of the cost involved (of the order of \$7,000,000) and the fact that this tunnel would serve but few of present residents on the mountain, it will probably be 20 years before this tunnel will be warranted.

The tunnel proposed can be two or four lane size as the need dictates at the time it is constructed. A four-lane tunnel will cost approximately 60% more than a two-lane tunnel. Twin tunnels of two-lane size could be built in sequence. The above estimate is for a two-lane tunnel.

The carrying out of this project will require a strip of Gage Park for right-of-way on which to place the bridge approach. The bridge will overcross Lawrence Road. A further project is to extend this right-of-way northerly alongside the railway track to the Midtown Expressway. In the ultimate arrangement Main Street and King Street could be undercrossed, and direct connection made to the depressed Expressway. This would link together the Midtown Expressway, Gage Tunnel and the Mohawk Expressway into one system.

11. Becketts Drive

From Amelia Street to the top of the mountain this road has an average grade of 5.5%. The steepest section is on Queen Street below Amelia Street where a grade of 7.5% is encountered. The average grade from Glenfern Avenue to the mountain top is just under 6%, a climb of 215 feet being made in 3600 feet.

Other than to widen this road and improve the line of sight at certain points, remove local variations in grade and make other minor betterments from time to time, no change is contemplated in the location and overall grade of this road. Some modification of the alignment of two or three hundred feet of this road will probably be required when the Dundurn Moun-

tain Access is put through, to permit same to underpass Beckett's Drive.

12. Dundurn Street Mountain Access Road

Dundurn Street from its position as a direct extension of the Western Entranceway, is bound to be a heavily travelled street, and the natural route for through traffic moving along the general line of Highway No. 6. Rather than route this traffic through the centre of the city, Dundurn Street should be extended up the mountain.

Another possibility is the use of the Chedoke Ravine. A road could be developed from the intersection of Dundurn Street and Hillcrest Avenue, rising westward along the mountain side and up this ravine. In the half mile of distance available to Fennel Drive at the head of the ravine, the rise is 225 feet, representing a grade of 8.8% which is useless. By a half mile tunnel from the head of the ravine, a 4.5% grade would be possible, with the outlet at Mohawk Road.

The presence of the creek in this ravine might present a problem. As well, this portion of the ravine is a natural beauty spot, to be preserved if possible.

Rather than either of the above, it is proposed to curve Dundurn Street easterly from the Hillcrest Avenue intersection, rising on a 4-1/2% grade to pass between the Mountain Avenue Reservoir and the playfield to the north. The road will underpass Beckett's Drive, and follow more or less closely the line of the graded pathway into the ravine in front of the Ontario Hospital. It enters tunnel at the head of that ravine at a depth 100 feet below mountain level and 60 feet below the grade of the James Street Access Tunnel in the immediate vicinity. It approximately parallels the latter for one thousand feet, then curves south to parallel West 5th Street, and underpassing Fennel Avenue comes to daylight 200 feet south, and reaches mountain level 1000 feet south of Fennel Avenue opposite St. Clair Road.

This project has a length of 6200 feet from the

south limit of Hillcrest Avenue, and rises 265 feet. The ruling grade is 4-1/2%, the average grade about 4-1/4%. The tunnel portion is 2200 feet long and artificial ventilation would be necessary.

As for a full mile there will be no intersecting streets or points of traffic conflict, a two-lane road is proposed, at any rate for initial construction.

The project further proposes that a 160 foot express right-of-way abutting West 5th Street be reserved from the Hospital Grounds from the mountain brow to Mohawk Road. This would provide direct access and outlet to both the Dundurn and James Street tunnel portals.

13. Emerson Street Mountain Access

Not an immediate possibility, there will come a time, with 200,000 persons resident on the mountain, when there will be a need for direct access to West Hamilton, the University and Dundas, from the Sanatorium and points on the mountain west of West 5th Street.

A road at 6% grade appears possible starting at Emerson Street and the West End Expressway, rising easterly along the mountain face, undercrossing the old radial embankment in the ravine in front of the Sanatorium, and continuing its ascent to about opposite West 31st Street when it enters a short tunnel under Fennel Avenue and West 30th Street and emerges at ground level about 300 feet southeast of this intersection.

It is suggested that in any subdivision of the lands at this corner, a diagonal street be inserted to provide direct access to the tunnel portal.

14. New Horning Mountain Road

This road is no longer in service, and as it represents prohibitive grades for modern traffic will hardly be re-opened. A road to take its place is proposed from its former outlet on the top of the

mountain, working westerly down the mountain face to meet Highway No. 8 at its junction with the proposed West End Expressway in the line between Concessions I and II. The distance available is about 4000 feet, and the descent to be negotiated is about 230 feet, representing about a 5-3/4% grade.

15. Glendale - Mount Albion Road

This road has already been referred to under 'Woodward Avenue' and is included among the North and South Major Streets.

It is an old trail which starting from King Street ascends the east bank of the King's Forest Ravine reaching the summit of the mountain at Mount Albion, two miles south. The total ascent is about 250 feet, of which the last 100 feet is made in one-quarter mile or less and presents the only real grade. This grade, however, can be eased without great difficulty.

The lower stretches of this road traverse beautiful countryside for development. The road itself, as well as serving this area, will have intensive use as a bypass road from Highway No. 53 to the Queen Elizabeth Way; also as an entrance to Hamilton from the suburban area east and south of Hannon. But as its outlet is south of Lime Ridge Road and on the line of Strathearne Avenue, it can serve only indirectly as an access road to city development on the mountain as such is likely to develop within the next twenty-five years.

COMPARABLE COSTS OF MOUNTAIN ROADS PROPOSED

Our studies have not been carried beyond ensuring that the proposals made herein are feasible, and that the grades, etc. quoted can be obtained. The costs given hereunder are approximate, intended for purposes of comparison only, and, are subject to revision when complete engineering surveys are available and plans in detail based on same have been prepared. These costs do not include contingent costs for new pavements, etc. on streets not affected as to grade, but cover only those sections

of streets and roads where new grade lines are established.

Dundurn Street Mountain Access Road	\$ 2,750,000
James - Queensdale Mountain Access Road	2,500,000
Jolley Cut, east from the Hairpin Turn	500,000
Walnut Street Connection to Mountain Blvd.	225,000
Claremont Hill - Charlton Hill Connection	500,000
Wentworth Street Bridge	500,000
Gage Avenue Tunnel	7,000,000
Mountain Blvd., C.N.R. Crossing	125,000
Mountain Blvd., T.H. & B. Crossing	750,000
Kenilworth Avenue Mountain Access Road	750,000
	\$ 15,600,000

SECTION 2

OFF-STREET PARKING PROGRAM

Temporary Parking Areas Along Midtown Expressway

It is elsewhere recommended that a right-of-way of a width not less than 165 feet, inclusive of any existing street, and up to 200 feet where economically warranted, be acquired for the Midtown Artery to permit its ultimate development as a grade-separated express thoroughfare when the need for such occurs; that only a sufficient width of the lands acquired be dedicated immediately as a public street as would be necessary to permit the existing pavement to be widened to six-lane width or 60 to 64 feet; that the balance be held in city ownership as private land and utilized initially for car-park purposes.

This would both ease the parking problem, as well as earn from parking tolls the carrying charges on the extra lands acquired, until these lands were in whole or part required for highway use.

For example, as part of this proposal, all the lands fronting on the north side of York Street between Dundurn Park and Bay Street would be acquired to their full depth, as well as certain properties on the cross streets necessary to obtain a more or less uniform width to the lands acquired in each block.

Between Dundurn Park and Queen Street, the lands proposed to be taken, after permitting the immediate widening of York Street to 80 feet would provide driver-parking space for 525 cars. The assessment of all the land to be taken, whether for street or car-parking, averages \$1.55 per sq. ft.

Between Queen Street and Bay Street, the lands proposed to be taken will provide, after the same width of street is allowed for, a total of 590 car spaces. The average assessment (due to greater depths taken) is virtually the same, viz. \$1.56 per sq. ft.

In assembling substantial blocks of land by municipal authority it is generally found that the acquisition price for each substantial block bears an almost fixed ratio to the total assessment of land and buildings included in that block. Our estimated cost of acquirement of the lands needed between Dundurn Park and Queen Street is \$520,000 and between Queen Street and Bay Street \$590,000. Part of these costs should be charged to the immediate widening of York Street, to say 80 feet. Such, if independently done, would require the demolition of all buildings and the cost of same would be charged entirely to street widening. Where additional land is taken for car-parking this cost is divided. If say, one-third is arbitrarily allocated to immediate street widening, the cost of lands for same would be \$370,000. The remaining \$740,000 would be chargeable to parking areas, or \$664 per parking space. An average revenue of 33¢ per day or \$2.00 per week would cover expenses of operation--together with interest and amortization on this cost of land per car space--always provided that reasonable restriction of on-street parking is maintained.

The use of these lands might vary from short-time meter-parking to all-day or over-night parking. Even the construction and renting by the month of temporary garages or car-stalls would be possible. These lands are located on a bus route, and cross-town service would follow any demand for same. Existing gas stations could be leased out, and where found warranted existing buildings, whose demolition was not immediately required for street widening, could be left standing and rented.

The above applies not only to the length of York Street, above referred to, but continuously across the city. It is, of course, not proposed that all the right-of-way for the Midtown Artery should be acquired immediately. Lands now subject to residential restrictions can very largely be left undisturbed for some time, possibly many years.

On the lands proposed to be acquired for the section of the Midtown Expressway between Dundurn Park and Birch Avenue, but not immediately required for that

purpose except to the extent necessary to widen existing pavements to six-lane width, parking for nearly 3600 cars can be obtained at an estimated average cost for land of \$566 per car space, or say \$750 each surfaced and equipped for use. To meet operating costs and cover interest and amortization on the cost of the land, a weekly revenue of \$2.15 is indicated as necessary. A list of these lands appears at the end of this section.

The use of the above right-of-way lands for parking purposes will be temporary and other provision must later be made to replace them. This would probably be accomplished by the erection of open-deck garages of four parking floors on sites totalling little more than one-quarter of the ground space given up. Certain extra widths of right-of-way acquired would be available for this purpose, and other sites would have to be acquired. The cost of the Expressway when built would include compensation to the Car-Park Branch for lands paid for out of parking tolls.

Permanent Parking Areas

In addition to the above expedient to kill two birds with one stone, it is recommended that the City acquire, now, certain sites for parking purposes with the intention that, at a later date, parking garages will be built on same when the need requires.

It is also believed, once it is recognized that curb-parking cannot be tolerated, that off-street parking facilities will be provided by private interests in increasing amount, either as a service to employees and customers, as purely commercial ventures serving the general public, or in accordance with zoning provisions to that end.

Zoning provisions requiring enterprises that create pressure for parking space, to provide a certain amount at their own cost; are becoming standard practice in United States cities. A commuted payment or a fixed annual payment under contract, to a municipal parking authority in lieu of this obligation would, in many cases, be of advantage to both the city and the particular enterprise.

The provision of parking space in the congested centre of any city or town is a modern problem. It is so universally needed, and so difficult for individuals to supply, that it has the characteristics of water supply or electricity with all the earmarks of a municipal obligation. There is no question but that those who individually receive the service must pay what it costs to provide. It can be provided much cheaper wholesale than on an individual basis.

Our survey of the parking needs has not covered more than the Central Section of the City, and even in that area in a preliminary way.

Permanent Parking Areas Recommended

In view of their key locations and their availability for the purpose, we recommend the immediate acquirement by the city of the following for pay-park purposes:

- 1.(a) The entire block bounded by Main Street, Jackson Street, Walnut Street and Catharine Street, from which would be deducted the strips required for the extension of Mary Street and the widening of Jackson Street. The residual areas would provide self-parking space for 450 cars. On this land would ultimately be constructed four-floor open-air-parking garages of first class architectural merit, with self-parking space for 1650 cars.

In the first instance the commercial buildings fronting Walnut Street and Catharine Street could be left intact and rented for present uses.

- 1 (b) The entire block bounded by Jackson Street, Hunter Street, Walnut Street and Catharine Street exclusive of the Queen Victoria School and Hunter Street frontage for the time being.

The whole area would have space for 550 cars (omitting the school property, 430 cars). With the later construction of four-floor parking garage, accommodation would be increased to 2000 cars.

The above two blocks, after providing for Mary Street extension, would provide surface parking for 1000 cars self-parked, with later development to 3650 car capacity possible. There is now and will be increasing pressure for car-parking facilities in this south-east quarter of the down-town, in view of the existing great extent of residential area below the mountain east of Wellington Street, and the great expansion of residential area that is certain on the Mountain-Top.

The immediate proposal is to convert to parking purposes all the block between Main and Jackson Streets, except the westerly 73 feet fronting on Catharine Street, and the new building at the corner of Main and Walnut, Jackson, Catharine and Hunter Streets.

After providing for the extension of Mary Street, and the widening of Jackson Street to Walnut Street, this area would accommodate 624 cars driver-parked, at an average acquisition cost per space of \$577. Allowing \$175 per space for surfacing, equipment, etc., the revenue per week needed for driver-parking operation on an investment of \$750, is \$2.15.

2. The two narrow blocks between Charles Street and Park Street, extending from Main Street to Hunter Street, or Whitehern Place.

The block between Main Street and Jackson Street has an area of 34,800 square feet, or space for 134 cars; that between Jackson Street and Hunter Street an area of 31,200 square feet, or space for 120 cars on a self-parking basis.

The average acquisition costs per space are estimated at \$728, and after allowing for surfacing and other costs of development, a total cost of \$850 per space is assumed, requiring a revenue to support same of \$2.50 per week.

This site provides an ideal situation for a four-level open-deck garage, the two upper levels of which would overpass Jackson Street. The two lower levels

would have access to Charles Street, and all four levels would have access to Park Street. The two upper levels would have access to Hunter Street. Such garage would have accommodation for 760 cars on a self-park basis, and it is estimated that at present costs, such accommodation could be provided for a total cost including land of about \$900 per space requiring a weekly income of \$2.60 to meet expenses.

This parking site would serve traffic from the west end and the Mountain-Top, as well as those destined to the business area on the west side of James Street. It should later be supplemented by the block bounded by Jackson Street, Whitehern Place, MacNab Street and Charles Street, when these lands come on the market. This lot would have capacity for 190 cars self-parked in a surface car yard.

3. The entire block bounded by John, Catharine, Gore and Cannon Streets. This block, after deducting the strip required for the Midtown Expressway, would provide self-parking space for 560 cars. With the development of the Midtown Expressway this block would be strategically located for parking purposes, and an open-deck garage of four floors would accommodate over 2000 cars.

Part of this area (29,000 square feet or 105 car spaces) is included in the right-of-way lands proposed to be acquired in connection with the Midtown Expressway.

This large block is remarkable in that the assessment roll shows it to contain no properties with buildings of any appreciable value. The assessment of the entire block averages 90 cents per square foot.

4. A parcel on the east side of Bay Street extending 244 feet along York Street, and 294 feet along Market Street. After allowing for the widening of Bay Street to 66 feet, parking space for driver-parked cars would be available for 265 cars, at an estimated acquisition cost per space of \$566.

Summary of Off-Street Parking Lots Proposed

A. Lands Required in Connection with Midtown Expressway between Dundurn Park and Birch Avenue.

After widening the existing pavements to six-lane width, the balance of these lanes will be available for temporary parking. Possibly 20% will be permanently available for parking.

Location on Midtown Expressway	Estimated Cost of Lands Taken for Ultimate Expressways (2½ Times Assessed Values of Land and Buildings)	Car Park Capacity of Lands not Immediately Required for Roadways	Cost per Parking Space on Basis 2/3 Cost Charged to Parking
Dundurn Park to Queen Street	\$520,000	525	\$660
Queen Street to Bay Street	590,000	590	667
Bay Street to MacNab Street	280,000	334	560
MacNab Street to John Street	870,000	-	-
John Street to Mary Street	320,000	444	480
Mary Street to Cathcart Street	185,000	278	444
Cathcart Street to Wellington Str.	167,500	78	1432
Wellington Street to Wentworth St.	550,000	700	524
Wentworth Street to Birch Avenue	425,000	625	453
	\$3,907,500	3574	\$566

B. Permanent Car Parks

	Estimated cost of <u>Lands taken</u>	Car <u>Capacity</u>	Cost per Parking <u>Space</u>
1. Lands on either side of Mary Street, Main St. to Jackson St. and on south side of Jackson Street	\$360,000	624	\$577
2. Blocks bounded by Charles, Main, Park and Hunter Streets	185,000	254	728
3. Balance of Block bound- ed by John, Gore, Cannon and Catharine Streets, not included in Expressway	245,000	455	539
4. Lands fronting on Bay Street as widened, between York and Market Streets	<u>150,000</u>	<u>265</u>	<u>566</u>
	940,000	1598	\$599
Estimated Acquisition Cost of Lands Allocated to Parking - - - - -	\$2,965,000	5172	\$573

To this \$573 average cost of land must be added \$175 to \$200 for cost of surfacing, barriers, meters, etc. We estimate that to operate these areas for driver-parking, a revenue of \$2.25 per week is necessary to carry an investment cost of \$775 per space.

Not included in the above cost of parking space is \$80,000, the estimated cost of widening Bay Street from King Street to York Street, or \$470,00 for the cost of widening and extending Mary Street from King William Street to Jackson and Walnut Streets.

A Parking Authority Recommended

It is recommended that the City establish an Off-Street Car-Parking Authority, to which the operation of the municipality's off-street parking facilities would be entrusted. Whether this entity was established as a Civic Department under a Commissioner, or as a Commission similar to the Parks Commission, is not of great moment, provided that its operations are carried on as a business operation, with full intention to make same self-sustaining.

Lands assigned by the City to off-street parking purposes, would have equivalent status to lands assigned for waterworks or fire department purposes, that is to say they would be private lands as much as would be any privately owned parking lot. The Authority would be responsible for the carrying charges on the lands assigned to it, provided these lands were reasonably suited for economic use as car-parks, and could charge such tolls for car-parking as Council, on its recommendation, might approve; or the Authority could rent for periods not in excess of one year for car storage or other purposes, such lands as were not immediately needed for transient parking by the general public.

Net revenue from parking meters located on the streets would be credited to the Parking Authority and earmarked for the extension of off-street parking.

Notice would be taken of the recommendations of the Parking Authority for the restrictions or elimination of on-street parking in vicinities where adequate off-street parking facilities were available for the general public whether supplied either by the Authority or by private parties.

SECTION 3

FINANCING THE PROGRAM

Logical Source of Revenue

Let it be said at once that, based on study and experience of the traffic and parking problems extending over thirty years, in our opinion these problems are insoluble except on the single basis that the motor vehicle itself pays the major share of the street improvements and parking facilities that its use demands.

That has been the considered conclusion of all the Royal Commissions that have been appointed to consider and report on the subject of Transportation. *

It is quite true that the motor vehicle has completely altered our mode and standard of living from what it was in 1910. But not to any greater degree than has electricity, the telephone, the movie or the radio in the same period. Yet all of these essential or pleasure-giving developments are universally expected to stand on their own feet and pay their own way.

It is true that roads have been essential since the dawn of civilization, and that the thing that creates a community is means of communication. A certain standard of roads is a social necessity. These are an obligation on the general taxpayer. But it is equally true that the demand of the motor vehicle is for roads far in excess of the widest interpretation of social necessity.

Certainly the streets and pavements existing in the developed area of Hamilton below the mountain more than fill all obligations of social necessity, yet more facilities are needed for the more convenient operation of the motor vehicle.

A not inconsiderable use of the streets and highways by the motor vehicle is recreational, pure and simple.

* Vide: Royal Commission on Transport, London 131, Article 249, p.70
The so-called "Duff Report" Ottawa 1931-2, " 170, p.57
The so-called "Chevrier Report", Toronto 1939 Pages 215-217

An even larger use is occasioned by the dollars-and-cents savings brought about directly or indirectly to the owner by the motor vehicle, particularly the commercial vehicle.

Both the above are justifiable if the individual user paid the cost of the extra facilities he requires.

We are not concerned with whether all direct or indirect taxes paid by the motor vehicle user are proper or not. We are concerned with the fact that, in the cities of Ontario, the motor vehicle subscribes virtually nothing toward the cost of the street facilities its use entails.

The sole income from motor vehicles received by the City of Hamilton is the annual contribution by the Provincial Government toward the cost of improvements on certain specified streets. The amount is approximately \$300,000 per year. Basically the Government contributes to the city 30% of the cost of an approved list of street betterments, but the list of approved projects in any year is trimmed to limit the contribution to about the amount stated.

Nor, in our opinion is it likely in view of the huge extent of the Province of Ontario, the insatiable demands for roads in rural and mining areas and to open up the North Country for tourist traffic, settlement and development--to say nothing of the demands of other cities facing equivalent difficulties--that contributions from provincial motor vehicle revenues to the City of Hamilton will for many years much exceed the annual sum of \$300,000 mentioned.

On a purely practical basis, it is a matter of general comment that the tax rate on real property has about reached its limit. The tremendous increase in municipal obligations for welfare and social services in latter years has indeed lessened the availability of funds for physical improvements.

It is not generally appreciated in Ontario, the extent to which the motor vehicle contributes to municipal revenues in many sections of the United States.

Personal Property Tax

A municipal tax on motor vehicles while completely absent in Ontario, and for some reason not now apparent, prohibited under Section 420, Subsection 11 of The Municipal Act, is current practice in the majority of the States in the United States. At least two-thirds of the States empower their municipalities to tax motor vehicles along with other personal property (which includes furniture, livestock, yachts, mortgages, bonds, etc.) and in most cities vehicle owners pay the general mill rate applicable to real estate on the full value of their motor-cars in the used car market. On a vehicle so assessed at \$500 the municipal tax would probably average \$12.50, and \$50 on a car valued at \$2000.

In Richmond, Va. - "the personal property tax on automobiles is at the rate of \$2.20 per \$100 of market value. (William T. Welles, City Clerk)

In St. Louis, Mo. - "Personal-property Tax \$2.75 on \$100 valuation". (Harry T. Koelling, Deputy Registrar)

Little Rock, Ark. - "All vehicles, like other personal property, are assessed by the assessor for ad valorem taxes, the legal rate being fifty per cent of value, the actual assessment being more nearly twenty-five per cent". (H.G. Graham, City Clerk)

Knoxville, Tenn. - Automobiles are included with other personal property assessment, and the tax is paid at the regular property tax rate. There is however an exemption of \$1000 on the total assessment of personal property". (W. H. Stapleton, City Recorder)

Chicago, Ill. - "Besides the State and City Licenses, owner must pay Personal Property Taxes on Motor Vehicles, based on fair valuation of the vehicle". (William T. Prendergast, City Collector)

Birmingham, Ala. - A Personal property tax of \$3.60, on each \$100 of assessed valuation is levied on motor-vehicles with \$1.80 of that amount going to the City and the other \$1.80 equally divided between the State and the County". (C.E. Armstrong, City Comptroller)

Charleston, S. C. - "Motor vehicles, like all other personal property in the State except household furniture, are subject to ad valorem taxes which are levied by the City, the County, and the School District. Such taxation this year totals 113 mills for the three taxing authorities. This millage is levied on an assessment based on 42% of the valuation determined by the average sales prices during the previous six months for vehicles of each model and make in the southeastern United States." (A.J. Tamsberg, Clerk of Council)

Charlotte, N.C. - "There is a personal-property tax levied on motor vehicles; the amount of tax depends upon the taxable value of the vehicles and the tax rate. Charges for the year 1948 will be arrived at by first using the average cash value as shown in the 'National Used-Car Market Report' on all 1948 model cars; the average value less a 10% deduction on all 1946 and 1947 model cars; the average value less 20% deduction on all prior year models. The tax rate for the year 1947 was \$1.70 for each hundred dollars of taxable value". (Campbell W. Ansley, Collector of Revenue).

As to the desirability or otherwise of a personal-property tax in Ontario we make no comment. But the above answers to a questionnaire sent out in 1948 indicate that American cities receive substantial revenue from motor-vehicles domiciled within their limits.

Municipal Motor Vehicle Licenses

But in addition to Personal-Property Taxes many United States cities impose municipal license fees or charge for 'sticker tags', for motor vehicles.

Chicago, Ill. - "The City of Chicago levies a Wheel-Tax on vehicles (horse drawn or motor driven) owned and operated in the city by persons or firms resident thereof, or by non-residents when the vehicle is operated for business purposes in the city as a regular thing. The tax is through the requirement that vehicles yearly procure a Chicago Vehicle License, the annual fees for which in the case of passenger vehicles, are based on the horse-power (S.A.E. Rating) of the vehicle, while in the case of trucks and trailers, fees are based on the gross weight of the vehicle and its maximum load."

"The fees the City of Chicago charges are those permitted by the State Law in the case of Cities of 200,000 or more. However those with a lesser population may charge fees of only one-half those we charge. I believe the latter would apply to all suburban communities in or near Chicago.

"Wheel-Tax or Vehicle License Fees collected by the City of Chicago must be used only for repair and upkeep of streets, or for the cost of collection or cost of traffic regulation. The city is also allowed a small portion of the Motor Fuel Tax the State collects, But the proper officers of the State must approve all expenditures of such for street-paving or repair within the City". (William T. Prendergast, City Collector)

Annual License fees for Vehicles in Chicago are as follows:

Passenger Automobile, 35 H.P. or less	\$10.00
Passenger Automobile, More than 35 H.P.	20.00
Motor Bicycle or Motor Tricycle	3.00
One horse Wagon or vehicle	5.00
Two horse Wagon or vehicle	10.00
Truck - 3,000 lbs and less (Vehicle & Max Load)	15.00
"over 3,000 lbs and not over 8,000 lbs	20.00
"over 8,000 lbs and not over 10,000 lbs	25.00
"over 10,000 lbs and not over 12,000 lbs	27.50
"over 12,000 lbs and not over 14,000 lbs	30.00
"over 14,000 lbs and not over 16,000 lbs	35.00
"over 16,000 lbs and not over 20,000 lbs	40.00
"over 20,000 lbs and not over 24,000 lbs	42.00
"over 24,000 lbs and not over 30,000 lbs	50.00
"over 30,000 lbs and not over 41,000 lbs (6 or more wheels)	55.00
"over 41,000 lbs and not over 45,000 lbs (6 or more wheels)	65.00
"over 45,000 lbs and not over 50,000 lbs (8 " " "	70.00
"over 50,000 lbs and not over 59,000 lbs (8 " " "	75.00
Trailer - 2,000 lbs or less (Vehicle & max. load)	12.00
"over 2,000 lbs and not over 5,000 lbs	24.00
"over 5,000 lbs and not over 10,000 lbs	28.00
"over 10,000 lbs and not over 15,000 lbs	30.00
"over 15,000 lbs and not over 20,000 lbs	35.00
"over 20,000 lbs and not over 32,000 lbs	45.00
"over 32,000 lbs and not over 36,000 lbs	50.00

Richmond, Va. - Passenger Automobiles in the business of or for the private use or benefit of the owner to be subject to a vehicle tax of 20¢ per 100 lbs or major portion thereof.

Trucks, trailers, etc. pay in accordance with maximum gross weight at an increasing rate for each 1,000 lbs increasement on the following (skeleton) basis

10,000 lbs gross weight or less	- 12¢ per 100 lbs.
15,001 to 16,000 lbs gross	- 18¢ per 100 lbs.
20,001 to 21,000 lbs gross	- 28¢ per 100 lbs.
25,001 to 26,000 lbs gross	- 38¢ per 100 lbs.
29,001 lbs and over	- 45¢ per 100 lbs.

Each unit of a tractor-trailer or semi-trailer combination to be separately licensed, but the gross weight of the combination of vehicles shall determine the gross weight for which each unit is taxed.

Special taxes also apply to Taxicabs and Buses.
(Extracted from The 'License Tax Ordinance Approved Dec. 23rd, 1947')

St. Louis, Mo. - "The City requires all automobiles owned in the City to carry 'City Stickers'. These are charged for at the following rates:

"Vehicles up to 25 Horse Power	- \$3.50
" " " 30 " "	- 5.50
" over 30 " "	- 7.50"

(Harry T. Koelling - Deputy Registrar)

Note: Information was confined to private automobiles.

Little Rock, Ark. - "The City of Little Rock collects a \$5 per year tax on all automobiles and trucks operated by residents of the city, and \$2.50 per year on "scooters" etc. The tax is a decalcomania sticker placed on the windshield of cars and trucks and a metal tag on other vehicles. The return from the tax is used to repair streets in the city". (H.C.Graham, City Clerk)

Knoxville, Tenn. - "The City of Knoxville requires the registration of all motor vehicles in addition to the State registration, for which a fee is charged as follows:

"Automobile of the 'C' Classification (lighter cars)	\$3.00
Motorcycles	3.00
All others	5.00"

(W.H. Stapleton, City Recorder)

Charlotte, N.C. - "We are permitted by North Carolina State Law to make an annual charge of \$1.00 for each motor vehicle within the City of Charlotte. The City of Charlotte levies a charge of \$1.00 for a City License Tag or sticker for cars, trucks and other motor vehicles from January 1st through December 31st of each year."

(Campbell W. Ansley, Collector
of Revenue)

As will be noted, all the above cities in addition to municipal license fees assessed personal property taxes on motor vehicles.

Recommendation

It is recommended that the City of Hamilton apply for legislation granting it the right to impose a municipal tax on all motor vehicles domiciled in the City, or within five miles of the city limit, when the owners of these suburban vehicles are in business or employed in the city, and regularly use their motor vehicle in the carrying on of that business within the city, or in travelling to and from their place of employment, and that the tax be that current in the City of Chicago. (See Schedule XV)

Without this source of revenue it seems idle to hope that street facilities can be provided adequate for the traffic either now or in the future.

The prohibition against cities imposing any such tax is carried forward from the Revised Statutes of 1927. It was enacted 30 years or more ago, when motor vehicles were relatively few, and the traffic problem hardly existed. It is long out-dated.

In 1920 there were only 5,771 passenger automobiles in Hamilton, and in 1927 only 14,360. There are now nearly that many trucks (12,000) and over three times that many automobiles (48,000).

While we are of the opinion that the right to charge a municipal motor vehicle wheel tax should be made available to all municipalities in Ontario, our recommendation limits it to Hamilton. The right to levy it on the motor-vehicles of suburban residents employed in the city would be reasonable only while the suburban municipality had not the power, or omitted to charge a similar fee on its own account.

Horse-drawn vehicles are few in number, and could well be omitted from this legislation. The city already has the power to collect license fees from them. Also, vehicles of farmers, using them in connection with the sale of their own produce at retail in Hamilton, should desirably be exempt from the tax.

The proceeds of this Tax would be earmarked for traffic improvements solely. In our opinion the proceeds of this Tax should not be funded, but be spent only as obtained.

On the basis of the Chicago rates, this tax should yield not less than \$750,000 annually. With this income dedicated to street and pavement improvements, a few years would see a marked improvement in traffic facilities in Hamilton.

Ten dollars per year is something less than 3¢ per day, or the cost of gasoline needed to run the vehicle a mile to a mile-and-a-half. On a trip of two miles through congested streets with stops and starts, vehicle performance may not exceed 12 to 14 miles to a gallon of gas. If through improved streets the mileage can be increased to 16 or 18 miles to the gallon, there is a saving of 0.042 to .032 gallons of gas in the two-mile trip, representing $1\frac{1}{2}$ cents saving in gasoline at present prices. This saving night and morning would pay the municipal tax. The saving in wear and tear on tempers would be all to the good, nor is any value put on the two minutes' time saved each trip.

In the case of a commercial vehicle the money losses due to congestion are much more pronounced, as are the savings from adequate roads.

Financing Off-Street Parking

Our recommendations in the matter of Off-Street Parking have already been made. In brief, they are that the City under the powers conferred by Section 404, subsection 46 (a) of The Municipal Act, acquire lands for off-street parking purposes, and operate them at such tolls as will make them self-sustaining. Also that any profits from meter-parking on the streets be utilized for the purchase of off-street parking space, and the profits from these lands utilized in the same way. These amounts would be relatively small. The initial cost of the greater part of the off-street facilities would be financed on city debentures, with a Parking Authority charged with the duty of meeting the City's obligations for interest and amortization. The city, in turn, would have to adopt a firm attitude with regard to the prohibition of parking on the streets. It has also been recommended that the Parking Authority be authorized to undertake, under contract with private parties and at their cost, the supply of off-street parking space required of these private interests under any zoning by-law. The Parking Authority would have the benefit of the City's powers of expropriation.

The operations of the Off-Street Parking Authority would be initiated in the Central Downtown, but would over the years ramify throughout the entire city, as local street congestion increased, and curb parking had to be increasingly curtailed.

The financial results attained by the Parking Authority will be wholly dependent on the support given by the city in the control of curb-parking. As a municipal venture, any deficit would have to be met by the city. On the other hand as its parking areas became fully paid for, its holdings would be an extremely valuable asset of the city.

SECTION 4

POWERS OF THE CITY TO CARRY OUT THE PROGRAM PROTECTING EXISTING ECONOMIC OPPORTUNITIES TO EXTEND AND WIDEN STREETS.Protecting the Future:

In all City Planning endeavours, but particularly in proposals for street openings and widenings, the essential problem is to preserve existing opportunities until the various projects can be undertaken. The construction of one major building in the line of a proposed street may so alter the economic aspect of the improvement as to sometimes (very foolishly) cause its abandonment.

This difficulty it must be said is particularly North American and is a heritage of a pioneer spirit of rugged individualism. But with the recognized need for planning and with increasing visible evidence available and what it can accomplish, the municipalities are slowly gaining control of their future development, without sacrifice of the legitimate interests of the individual property owner.

The first attempt in Ontario to meet this very obvious difficulty was The Deferred Widening Act of 1912. The land required for a street widening was expropriated as of the date of the by-law, but the physical work entailed in widening the street was deferred 3 to 10 years as stated in the by-law. The hope behind the legislation was that during the deferred period there would be little actual work to be done and this would result in no particular disturbance to business or traffic. An owner who rebuilt was given the privilege of constructing a one storey front out to the old street line to avoid his building being pocketed. This Act is still in the Statutes, but is complicated in its operations, and except for the widening of Bloor Street in Toronto has never been used. It is, however, available, and in certain circumstances, particularly such as in the opening of a short street, might prove of extreme value.

Another attempt to preserve opportunity, following more the line of British and European practice is the Toronto Legislation of 1948. This is given at length as Appendix XI.

This legislation permits the city as a preliminary to widening a street to establish a new building line on streets built out to the existing street line, to which building line all future buildings or reconstructed buildings must conform. There is no time limit set for action on the part of the city or of any private owner. When an owner decides to rebuild he has two options. To sell the vacant land between the street line and the building line to the city (which is obligated to buy it) at its then value, or to retain same and erect on it a one storey front at his own risk, as he will not be compensated for same. Only when three quarters of the property in any block are built back to the building line or when a majority of property owners in any block petition for the widening in that block to be gone on with, is the city obligated to widen the street back to the building line. On the other hand there is nothing to prevent the city proceeding with the widening at any time by passing the requisite by-law. The city is expressly relieved of any liability for establishing a building line under this legislation.

It is strongly recommended that the City of Hamilton apply for this specific legislation. It would, for example, be very applicable on King Street, between King Street and Wellington Street. Toronto has already passed two by-laws under the provisions of this Act, establishing building lines on Yonge Street and on Avenue Road.

The Toronto Act provides that the new building line may be established up to 20 feet back from the street line. It specifically had the widening of Yonge Street from College Street northerly in mind -- a street uniformly 66 feet wide and continuous across all intersections. It was also desirable to keep the legislation at its introduction, as simple as possible.

But where streets are of variable width or where jogs exist, it can be seen that, to provide a continuous and uniform street, at certain points and through certain and through certain blocks, the building line (that will ultimately be the new street line) may have to be in excess of 20 feet from the existing street line, and possibly on a bevel or curve.

To overcome this difficulty we recommend that Hamilton apply as well for an additional clause to the Toronto Act along the lines of the following:

- (8) When necessary to carry out an Official City Plan, or when necessary or advisable in the interest of the appearance or utility of the street, the Board may authorize the fixing of the building line on any portion or portions of said street or highway at a greater distance than twenty feet from the street line, and such distance need not be uniform from point to point along said portion or portions of said street or highway.

Provided always that where the building line is not at a uniform distance from the existing street line, a plan or plans prepared by an Ontario Land Surveyor, showing the position of the said building line in relation to the existing street line at the limits of the various properties affected, shall be attached to the by-law and registered in the Registry Office and a notation to that effect entered on the abstract of every lot affected, and the pertinent plan or portion of said plan showing to what extent an owner's land and buildings are affected is forwarded by registered mail to the owner in accordance with the last revised assessment roll.

Once the Major Street Plan is part of the Official Plan, an owner whose lands are seriously affected is protected by the power of the City to take over the owner's entire holding, if need be. At the same time the city has protected its interests by having given notice as to what lands it will require for future public needs.

Adoption of the Major Street Plan

It is recommended that this Major Street Plan be adopted by the Planning Board and recommended to council as an addition to the Official Plan, whereupon the following clauses of the "Planning Act" are applicable:

- 8(1) The plan as finally prepared and recommended by the planning board shall be submitted to the Council.
- (2) The Council may adopt the plan by a vote of the majority of all members.

- 9(1) Upon adoption the plan shall be submitted by the council to the Minister who may refer the plan to any department of the public service of Ontario that may be concerned therewith and to the Hydro Electric Power Commission of Ontario, and where the planning area consists of more than one municipality the Minister shall refer the plan to the Council of every municipality in the planning area, and if modifications appear desirable, settle such modifications as far as possible to the satisfaction of all concerned and cause the plan to be amended accordingly.
- (2) The Minister may then approve the plan, whereupon it shall be the official plan of the planning area.
- 11 The provisions of this Act with respect to an official plan shall apply mutatus mutandis to alterations and additions thereto, provided that the Minister may approve any alteration or addition that may be proposed by the council of any municipality.
- 15(1) For the purpose of developing any feature of the official plan a municipality with the approval of the Minister, may at any time and from time to time,-
- (a) Acquire land within the municipality;
 - (b) hold land heretofore or hereafter acquired within the municipality; or
 - (c) sell, lease or otherwise dispose of land so acquired or held when no longer required.
- (2) For the purpose of developing any feature of the official plan the designated municipality, with the approval of the Minister, may exercise any of the powers mentioned in subsection (1) in respect of land within the planning area.
- (3) For the purpose of developing any feature of any official plan, a county, with the approval of the Minister, may exercise any of the powers mentioned in subsection (1) with respect to land within the county.
- (4) Any county or municipality may contribute toward the cost of acquiring land under this section.

- 17 The provisions of The Municipal Act shall apply to the acquisition of land under section 15 or 16.
- 18 When a municipality has acquired or holds lands for any purpose authorized by this Act, the municipality may clear, grade or otherwise prepare the land for the purpose for which it has been acquired or held.
- 19 When a municipality acquires land for any purpose authorized by this Act, the whole or partial consideration therefore may be land then owned by the municipality.

It is clear from the above that once the Major Street Plan is made part of the Official Plan the city would have full power to acquire any parcel of land affected, and to rent it in its present condition, if not immediately needed for the purposes of the plan.

It is our opinion that any lands affected by this Major Street Plan, if purchased by the city and not immediately required, could earn their carrying charges if utilized for car parking, under reasonable restrictions of on-street parking.

Our recommendations for a municipal tax on motor vehicles is carried in the previous section, as is also our recommendation for off-street parking at sustaining tolls. This last is now within the powers of the City under Section 514, subsection 7 of The Municipal Act.

We have also elsewhere in this report recommended that the city apply for similar legislation to that obtained by St. Catharines in 1949, permanently earmarking any profits from curb parking meters for the provision of off-street parking.

We have also recommended that an Off-street Parking Authority be set up to operate all off-street parking facilities as a public utility on a self-sustaining basis but left open the question as to how this should be organized.

In this connection we note in the October 1950 issue of Traffic Engineering an article by Theodore M. Matson, Director of the Bureau of Highway Traffic, Yale University

on the Parking Problems of American Cities in which he surveys the trends in financing off-street parking in United States cities and reaches this conclusion "In the larger cities (250,000 and up) it would appear that the entire cost of parking facilities will be borne by the automobile user through parking fees".

Conclusion

The development of a system of Major Streets, such as herein proposed cannot be accomplished without the expenditure of money. Be assured that if the traffic problem is solved the necessary expenditure will be made, plan or no plan. If not spent the Central City will die of suffocation. It is our conviction, in common with the great mass of thinking today, that money expended in accordance with a plan accomplishes most for the money, and brings about a co-ordinated entity, whether street system or summer cottage, not otherwise possible.

It has been our experience, from our connection with or intensive interest in city planning ventures, that nothing reacts more to the progress of a city, to the pride of the citizens, and the increase in taxable wealth, than does the carrying through of major street projects. This is very apparent in the carrying out of the Toronto Rapid Transit project.

There is sometimes evidence of a feeling that if the most minor house is torn down for a street improvement, that the owner will take his compensation money, and immediately leave to spend it in Vancouver or Los Angeles. Nothing is farther from the fact. Rather experience is that the owner takes his money, finds an equal sum to add to it, and builds a new house in some other location. A lot of investment in old property is frozen, and a few city expropriations are a wonderful catalyst. Nor does a municipality pay excessive sums when it expropriates or threatens to expropriate. The sales opportunity of the individual property is curtailed to one buyer. The index value of house sales in Toronto, is over $2\frac{1}{2}$ times the assessed values. Acquirements for Rapid Transit right-of-way have averages less than 2.

As we have repeatedly stressed in this report it is our considered opinion that the extraordinary requirements of the motor vehicle should be paid for by it. Certainly existing streets and pavements in the developed area of the city below the mountain satisfy all the obligations of Social Necessity, providing access to all properties, and permitting the carrying on of all community functions. It is not too much to expect that additional facilities required only for the unhampered use of the motor vehicle should be paid for by it. The power to tax motor vehicles requires special legislation, and we urge that application for this be made. Without this source of revenue we frankly see little hope for the development of any proper street system in Hamilton that will begin to meet present conditions, let alone what the future may have in store.

Any extended delay in getting under way the basic recommendations made herein, or any policy of laissez-faire, will lead inevitably to a single end - decentralization and the blight of down-town. We feel it is our duty to so advise the Planning Board.

Again we would point out that the plan envisioned is a long term plan extending over thirty or possibly fifty years. It may be twenty years before a grade separated roadway would be available along the length of the Midtown Expressway, but twenty years is but a brief period in the life of a city.

x - x - x - x - x

Outbound

Inbound

Street	<u>Inbound</u>				<u>Outbound</u>				TOTAL	<u>Trucks</u>			Hrs. Drn.	St. Car	TOTAL
	<u>Autos</u>	<u>Lt.</u>	<u>Hvy.</u>	<u>Bus</u>	<u>Cyc</u>	<u>Hrs. Drn.</u>	<u>St. Car</u>	<u>TOTAL</u>		<u>Lt.</u>	<u>Hvy.</u>	<u>Bus</u>	<u>Cyc</u>		
Hunter	249	49	9		30	9		346	455	89	15		37	3	599
Jackson	287	68	10		21	9		395	463	90	10		13	6	582
Main	4994	976	87	381	65	11		6,514	4519	762	184	368	53	7	5,893
George	315	81	5		12	1		414	214	108	5		13	4	3,344
King	3422	628	175	168	77	9		4,479	2686	599	150	159	68	17	3,679
Market	274	106	62		9	5		4,456	2699	1366	64		16	3	4,488
Napier	234	125	4	1	38	8		410	163	97	4		9	5	278
York	3318	905	336	132	119	10		4,820	3361	1116	624	140	83	9	5,333
TOTALS:	13093	2938	688	682	371	62		17,834	12130	2997	1056	667	292	54	17,196

NORTH SIDE

Street	<u>Inbound</u>				<u>Outbound</u>				TOTAL	<u>Trucks</u>			Hrs. Drn.	St. Car	TOTAL
	<u>Autos</u>	<u>Lt.</u>	<u>Hvy.</u>	<u>Bus</u>	<u>Cyc</u>	<u>Hrs. Drn.</u>	<u>St. Car</u>	<u>TOTAL</u>		<u>Lt.</u>	<u>Hvy.</u>	<u>Bus</u>	<u>Cyc</u>		
Bay	1556	590	213	1	36	30		2,426	1310	427	164		45	28	1,974
Park	645	243	38		25	19		970	676	257	60		21	4	1,018
MacNab	1061	345	106		447	5		1,564	1135	356	88		42	10	1,631
James	2073	475	172	1	99	6	311	3,137	1945	491	84	1	84	13	2,924
Hughson	638	177	50		27	12		904	677	214	58		23	3	2,975
John	2377	630	197		87	7		3,298	2017	594	188	3	101	12	2,915
Catharine	757	185	58		43	9		1,052	807	181	42		47	14	1,091
Mary	551	210	25		70	7		863	551	226	36		61	8	882
Elgin	272	97	45		48	7		469	136	49	27		33	6	251
Ferguson	357	172	29		32	2	27	619	411	171	51		27	3	689
Cathcart	295	78	23		34	8		438	188	82	21		25	7	323
Wellington	1587	435	205	188	61	24		2,500	1691	527	141	192	89	11	2,651
TOTALS:	12169	3637	1161	190	609	136		311 18,240	11544	3575	960	196	598	119	17,324
							27							26	

✕ (trains)

✕ (trains)

Inbound

Outbound

<u>Street</u>	<u>Autos</u>	<u>Trucks</u>	<u>Bus</u>	<u>Cyc.</u>	<u>Hs. Drn.</u>	<u>St. Car</u>	<u>TOTAL</u>	<u>Autos</u>	<u>Trucks</u>	<u>Bus</u>	<u>Cyc</u>	<u>Hs. Drn.</u>	<u>St. Car</u>	<u>TOTAL</u>
		<u>Lt.</u>	<u>Hvy.</u>						<u>Lt.</u>	<u>Hvy.</u>				

EAST SIDE

Wilson	379	154	21	160	19		733	500	147	28		144	17	836
King William	908	251	41	106	11		1,317	1003	286	37		103	14	1,443
King	2804	459	78	125	8	316	3,840	2366	493	30	62	117	6	3,396
Main	5747	1130	61	165	12		7,398	5909	1122	322	274	189	16	7,832
Hunter	543	69	22	85	10		732	671	102	32	1	88	13	907

TOTALS:

10381	2063	223	336	641	60	316	14,020	10449	2150	449	337	641	66	322	14,414
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SOUTH SIDE

Wellington	1521	237	72	48	6		1,884	1096	199	75		50	7	1,427
Walnut	359	123	45	47	13		587	381	125	36		31	21	594
Catharine	137	44	9	40	3		233	322	64	15		59	5	465
John	3219	756	323	106	15		4,729	2916	768	255	312	102	10	4,363
James	3058	420	68	109	3		3,817	2792	409	92	156	113	1	3,563
Park	411	59	10	60	4		544	280	44	3		58		385
Bay	647	148	11	38	6		850	742	136	31		68	11	988

TOTALS:

9352	1787	538	469	448	50		12,644	8529	1745	507	468	481	55	11,785
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1875

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Movement across Bay Street April 1950

Street	East or Inbound					West or Outbound					Hs. Drn	St. Car	TOTAL
	Autos	Trucks Lt.	Hvy	Bus	Cyc.	Autos	Trucks Lt.	Hvy	Bus	Cyc.			
Aberdeen	2015	243	13	1	23	1	1460	188	13	2	21	4	1,688
Markland	411	75	14		31	4	447	85	14		21	4	571
Herkimer	1548	270	64	150	70	8	1569	274	76	151	49	7	2,126
Charlton	452	99	27		52	23	492	103	36		43	20	694
Robinson	207	42			18	7	207	54			23	7	291
Duke	248	55	1		17	5	245	55	1		10	3	314
Bold	315	45	8		31	1	298	55	9		43	9	414
Hunter to York)													
Inclus.)	13093	2938	688	682	371	62	12130	2997	1056	667	292	54	17,196
Schedule I)													
Cannon	1647	712	379		58	22	1957	747	409	1	62	34	3,210
Mulberry	150	129	39		11	1	108	91	36		6		241
Sheaffe	70	36	11		7	7	85	35	15		9	7	151
Barton	638	126	3		8		539	98	8		12	1	658
Stuart	666	148	91		17	3	566	106	67		16	3	758
TOTALS:	21460	4918	1338	833	714	144	20103	4888	1740	821	607	153	28,312

Movement Up and Down Mountain -- Bay to Wellington

	<u>Downbound</u>					<u>Upbound</u>						
James St. Mt. Rd.	508	62	9	4	2	585	630	84	10	4	1	729
Mt. Blvd. E. of John	1320	220	2	5	3	1,560	1687	301	3	6	2	2,013
Arkledun Avenue	4930	960	232	313	3	6,582	4078	834	283	309	4	5,536
TOTALS:	6818	1262	243	318	8	8,727	6395	1219	296	315	7	8,278

East or OutboundWest or Inbound

Street	<u>West or Inbound</u>				<u>East or Outbound</u>				TOTALS	Hs. Drn.	St. Car	TOTALS
	<u>Autos</u>	<u>Trucks Lt. Hvy.</u>	<u>Bus</u>	<u>Cyc.</u>	<u>Autos</u>	<u>Trucks Lt. Hvy.</u>	<u>Bus</u>	<u>Cyc.</u>				
Charlton Ave.												
Young	168	52	12	1	303	67		21	418	4		
Stinson	2271	366	17	54	1582	296	49	90	2,049	12		
Hunter to)												
Wilson Incl.)	10381	2063	223	336	10449	2150	337	641	14,414	66	322	
Schedule I)												
Evans	42	27	1	23	42	20		20	87	3		
Cannon	4112	1208	132	205	3575	1005	212	158	5,260	37		
Robert	127	41		25	95	41	1	28	169	3		
Barton	3597	852	290	4	3691	837	3	213	5,298	20	200	
Birge	238	34	28	34	261	51	1	32	377	4		
Ferrie	134	48	45	33	174	38		55	310	12		
Ferrie Bridge	598	115	20	33	538	118		44	732	1		
Burlington	2400	916	305	1	2400	766	3	108	3,878	2	126	
Excluding												
Charlton St.	24068	5722	1073	601	23110	5389	606	1410	32,992	164	648	

Traffic Across Chedoke Ravine - April 1950.

Street	East or Inbound					West or Outbound					TOTAL			
	Trucks					Trucks						Hs. Drn	St. Car	
	Autos	Lt. Hvy.				Autos	Lt. Hvy.							
		Bus	Cyc.	Hs. Drn	St. Car		Bus	Cyc.	Hs. Drn	St. Car				
Longwood Bridge	1815	267	74	34	89		2,279	1834	286	74	32	75		2,301
Main Street	3106	616	223	139	40	1	4,125	2890	560	240	139	46	3	3,878
King Street	3283	856	73	168	119	10	4,509	3016	837	153	172	136	9	4,323
Western Entrance	3705	707	434	71	31		4,948	3850	771	439	68	30		5,158
	11909	2446	804	412	279	11	15,861	11590	2454	906	411	287	12	15,660

Traffic To and From Mountain

Beckett Drive	827	125	2	21	7	982	786	141	1	3	20	6	956
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Traffic across Bay St.

	West or Inbound			East or Outbound			
	Autos	Lt. Hvy.	Bus Cyc.	Autos	Lt. Hvy.	Bus Cyc.	
Aberdeen to) Stuart Street) Incl. Sched-) ule II)	20,103	4888	1740	821	607	153	28,312
							21,460
							4918
							1338
							833
							714
							144
	32,839	7459	2546	1233	907	171	45,155
							33,836
							7513
							2247
							1244
							1021
							162
							46,023

Total into area 45,155

Total leaving area 46,023

Inventory to 1811

Inventory to 1811

DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT
1811	100.00	1812	100.00	1813	100.00	1814	100.00

1815	100.00	1816	100.00	1817	100.00	1818	100.00
1819	100.00	1820	100.00	1821	100.00	1822	100.00
1823	100.00	1824	100.00	1825	100.00	1826	100.00

1827	100.00	1828	100.00	1829	100.00	1830	100.00
1831	100.00	1832	100.00	1833	100.00	1834	100.00
1835	100.00	1836	100.00	1837	100.00	1838	100.00

1839	100.00	1840	100.00	1841	100.00	1842	100.00
1843	100.00	1844	100.00	1845	100.00	1846	100.00
1847	100.00	1848	100.00	1849	100.00	1850	100.00

1851	100.00	1852	100.00	1853	100.00	1854	100.00
1855	100.00	1856	100.00	1857	100.00	1858	100.00
1859	100.00	1860	100.00	1861	100.00	1862	100.00

1863	100.00	1864	100.00	1865	100.00	1866	100.00
1867	100.00	1868	100.00	1869	100.00	1870	100.00
1871	100.00	1872	100.00	1873	100.00	1874	100.00

1875	100.00	1876	100.00	1877	100.00	1878	100.00
1879	100.00	1880	100.00	1881	100.00	1882	100.00
1883	100.00	1884	100.00	1885	100.00	1886	100.00

1887	100.00	1888	100.00	1889	100.00	1890	100.00
1891	100.00	1892	100.00	1893	100.00	1894	100.00
1895	100.00	1896	100.00	1897	100.00	1898	100.00

SCHEDULE IV

EAST CENTRAL AREA - Bounded by Wellington Street - T.H. & B. Main line, T.H. & B. Belt line & Waterfront

Street	<u>Inbound</u>					<u>Outbound</u>					TOTAL		
	<u>Autos</u>	<u>Trucks</u> <u>Lt.</u> <u>Hvy</u>	<u>Bus</u>	<u>Cyc.</u>	<u>Hs.</u> <u>Drn</u>	<u>St.</u> <u>Car</u>	<u>Autos</u>	<u>Trucks</u> <u>Lt.</u> <u>Hvy</u>	<u>Bus</u>	<u>Cyc.</u>		<u>Hs.</u> <u>Drn</u>	<u>St.</u> <u>Car</u>
<u>EAST LIMIT</u>													
Cumberland	721	102	79	18	5		712	103	83	1	24	2	925
Maple	776	155	130	58	9		998	192	122	200	68	9	1,589
Main	4,090	808	64	116	7	202	4,422	824	257	99	69	6	5,861
Dunsmuir	252	38	22	18	11		252	57	26		38	10	383
King	3,851	612	205	122	43		2,411	461	155	70	111	32	3,240
Cannon	2,552	619	72	71	40		2,496	624	145	185	40	13	3,503
Primrose	75	24	12	15	9		93	24	13		38	5	173
Barton	2,810	588	315	103	16	204	3,067	610	306	3	69	15	4,282
Beach	886	275	64	58	9		902	262	62		72	12	1,310
Ottawa C.N.R.	845	84	106	38	6		829	73	158	48	35	3	1,146
Burlington	2,133	554	253	50	1		2,276	541	328	25	68	2	3,240

WEST LIMIT
 Burlington)
 Young Street)
 Incl.)
 Schedule II)

18,991 3859 1322 654 667 156 406 26,055 18,458 3771 1655 631 632 109 396 25,652

23,110 5389 1665 606 1410 164 648 32,992 24,068 5722 1073 601 1393 182 638 33,677

SOUTH LIMIT

Wentworth St. 1,527 200 41 2 27 1 1,798 1,222 179 2 25 2 1,430

43,628 9448 3028 1262 2104 321 1054 60,845 43,748 9672 2730 1232 2050 293 1034 60,759

WATERFRONT INDUSTRIAL ZONE - Movement In and Out West Portion: Wellington to T.H. & B. Belt Line North of C.N.R. Main Line

Street	Inbound					Outbound					TOTAL			
	Autos	Trucks Lt. Hvy.	Bus	Cyc.	Hs. Drn.	St. Car	Autos	Trucks Lt. Hvy.	Bus	Cyc.		Hs. Drn.	St. Car	
WEST SIDE														
Burlington	2,400	766	473	3	108	2	126	3,878	2,400	916	305	1	129	3,876
Ferrie Bridge	538	118	31		44	1		732	598	115	20		33	771
Ferrie	174	38	31		55	12		310	134	48	45		33	267
	3,112	922	535	3	207	15	126	4,920	3,132	1079	370	1	195	4,914
SOUTH SIDE														
Victoria	1,270	429	138	47	152	18		2,054	1,154	398	127	53	156	1,901
Wentworth	1,492	457	163	5	190	12		2,319	1,500	421	136		224	2,294
Birch	1,202	242	91	8	116	5		1,664	1,084	237	95	1	117	1,536
Sherman	1,425	336	94	64	92	5		1,996	1,678	394	73	63	151	2,367
Lottridge	666	103	106		92	8		975	817	106	101	2	99	1,134
Gage	980	186	210		104	11		1,491	1,056	247	143	6	107	1,565
	7,035	1753	782	124	746	59		10,499	7,289	1803	675	125	854	10,797
EAST SIDE														
Beach	886	275	64		58	9		1,292	902	262	62		72	1,310
Ottawa	845	84	106	42	38	6		1,121	829	73	158	48	35	1,146
Burlington	2,133	554	253	22	50	1		3,013	2,276	541	328	25	68	3,240
	3,864	913	423	64	146	16		5,426	4,007	876	548	73	175	5,696
TOTALS:	14,011	3588	1740	191	1099	90	126	20,845	14,428	3758	1593	199	1224	21,407

MOUNTAIN ROADS - Traffic Up and Down

Up or southbound

Street	Autos			Trucks			Hs. St.			TOTAL			Autos			Trucks			Hs. St.			TOTAL		
	Lt.	Hvy.	Bus	Cyc	Drn	Car	Lt.	Hvy.	Bus	Cyc	Drn	Car	Lt.	Hvy.	Bus	Cyc	Drn	Car	Lt.	Hvy.	Bus	Cyc	Drn	Car
Beckett Drive	786	131	3	20	6								827	125	2	21	7							982
James St.Mt.Rd.	630	84	10	4	1								508	62	9	4	2							585
Arkledun Ave.	4078	834	283	309	4								4930	980	232	313	64	3						6,582
Mtn. Boulevard	1687	301	3	6	2								1320	220	2	5	10	3						1,560
Charlton Hill	1346	156	86	2	2								1682	155	56	3	17	5						1,918
Ottawa Street	1376	359	13	9									1238	312	4	10	4							1,565
	9903	1875	398	317	15								10565	1854	305	321	126	24						13,195
	M	M	M	M	M								M	M	M	M	M							

South

Traffic on Provincial Highways - South from Fennel Avenue

#6 James St. S.	1770	499	177	21	46	2	2,515	1958	507	201	19	40	2,725
#55 Gage St.	440	130	35	5	13		623	507	141	39	5	14	706
	2210	629	212	26	59	2	3,138	2465	648	240	24	54	3,431

Note

An estimated 1200 automobiles and 200 light trucks do not arrive or depart from the mountaintop but use the Mountain Boulevard as a bypass to Wentworth Street and Ottawa Street and vice versa.

WEST HAMILTON AREA - Traffic in Westdale

Outbound - West Bound

Inbound - East Bound

Street	Trucks				TOTAL		Trucks				TOTAL			
	Autos	Lt.	Hvy.	Bus Cyc.	Hs. Drn	St. Car	Autos	Lt.	Hvy.	Bus Cyc.	Hs. Drn	St. Car		
Traffic across Chedoke Ravine into and out of Westdale and West Hamilton														
Schedule III	11,590	2454	906	411	287	12	15,660	11,909	2446	804	412	279	11	15,861

Traffic across West Limit of West Hamilton and Westdale

Longwood at																
Frank																
Highway No.102	1,115	250	176		21		1,562	1,235	260	173	1	16		1,685		
" " 102	2,119	469	219	2	34		2,843	1,814	440	229	3	19		2,505		
Highway No.8	8	8			2		18	16	3			1		20		
Highway No.2	370	77	12	102	15		576	486	74	21	110	25		716		
	1,059	197	219	27	16		1,518	1,358	248	235	23	28		1,892		
	4,671	1001	626	131	88		6,517	4,909	1025	658	137	89		6,818		

Total Traffic on Main Street, West of Emerson Street (at East side of Highway No. 102)

Routed No.102	2,119	469	219	2	34		2,843	1,814	440	229	3	19		2,505		
" Main W.	2,124	577	278	127	83	2	3,191	2,316	558	320	138	95	2	3,429		
	4,243	1046	497	129	117	2	6,034	4,130	998	549	141	114	2	5,934		

MISCELLANEOUS COUNTS - In East End of City

Street	Autos		Trucks		Hs. St.		TOTAL		Autos		Trucks		Hs. Drn		TOTAL	
	Lt.	Hvy	Lt.	Hvy	Cyc.	Drn	Car	Car	Lt.	Hvy	Lt.	Hvy	Cyc.	Drn	Car	Car

INTERSECTION KING & MAIN STREETS

(1) Main St. W.S. King. E.B.																
(2) Main St. W.S. King. W.B.																
Straight thru To King St. From	3,344	629	219	76	79	7	192	4,546	3,072	472	172	70	83	5	194	4,068
	1,395	288	64	40	39	6	1,832	1,011	144	24	7	23	5			1,214
	4,739	917	283	116	118	13	192	6,378	4,083	616	196	77	106	10	194	5,282

(3) Main St. E.S. King E.B.																
(4) Main St. E.S. King W.B.																
Straight thru From King N.	3,344	629	219	76	79	7	192	4,546	3,072	472	172	70	83	5	194	4,068
	1,278	271	48	45	14		1,656	1,993	334	81	5	108	9			2,530
	4,622	900	267	76	124	21	192	6,202	5,065	806	253	75	191	14	194	6,598

(5) King St. N.S. Main. E.B.																
(6) King St. N.S. Main. W.B.																
Straight thru To Main	1,429	253	49	63	102	6	1,902	1,732	247	64	56	88	9			2,196
	1,278	271	48	45	14		1,656	1,993	334	81	5	108	9			2,530
	2,707	524	97	63	147	20	3,558	3,725	581	145	61	196	18			4,726

(7) King St. S.S. Main. E.B.																
(8) King St. S.S. of Main St. W.B.																
Straight thru Via Main St.	1,429	253	49	63	102	6	1,902	1,732	247	64	56	88	9			2,196
	1,395	288	64	40	39	6	1,832	1,011	144	24	7	23	5			1,214
	2,824	541	113	103	141	12	3,734	2,743	391	88	63	111	14			3,410

FORK IN MAIN STREET INTO HIGHWAY NO. 8 AT STRATHEARN

Highway No. 8 Main St. E. " W of Fork	2,334	506	154	72	36	3	3,105	2,677	701	154	75	43	7			3,657
	838	242	49	2	86	3	1,220	746	237	47	3	104				1,137
	3,172	748	203	74	122	6	4,325	3,423	938	201	78	147	7			4,794

Street	Trucks				Hs. St.		TOTAL	Trucks				Hs. St.		TOTAL
	Autos	Lt.	Hvy.	Bus	Cyc.	Drn		Car	Autos	Lt.	Hvy.	Bus	Cyc.	
<u>Parkdale Avenue at Beach Road</u>														
	537	217	134	74	10		972	525	204	128	73	8	1	939
<u>Beach Road at Windermere Cutoff</u>														
	<u>Westbound</u>							<u>Eastbound</u>						
Beach Road E.	1,103	267	125	49	18		1,562	1,108	238	119	53	5		1,523
Windermere Cutoff	2,184	342	250		17		2,793	1,837	314	255		11		2,417
Beach Road W.	3,287	609	375	49	35	A	4,355	2,945	552	374	53	16		3,940
<u>No. 8 Highway at Potruff Road W.S.</u>														
	<u>Westbound</u>							<u>Eastbound</u>						
	1,912	461	119	54	23	B	2,569	2,259	481	144	48	20		2,952
<u>Barton Street at Nash Side Rd.</u>														
	<u>Westbound</u>							<u>Eastbound</u>						
	777	129	55		18	C	979	787	164	51	2	27		1,031
<u>King St. at Red Hill Creek</u>														
	<u>Westbound</u>							<u>Eastbound</u>						
	482	133	37	12	29	D	693	472	98	25	13	21	1	630
<u>PASSING EAST LIMIT OF CITY</u>														
A. B. C. D.	6,458	1332	586	115	105		8,596	6463	1295	594	116	84	1	8,553

Vehicle Movement by Periods of Normal Day April 1950
In and Out of Downtown Area Bounded by Outer Limits of Hunter,
Bay, Vine-Wilson, and Wellington Streets

140

6:00 AM to 9:15 AM	In	Out	In	Out	In	Out	In	Out	In	Out
At South Side	2384	820	310	269	113	121	88	52	10	16
At West Side	2615	1521	462	485	195	285	53	30	21	31
At North Side	1500	2158	639	535	317	231	120	88	49	59
At East Side	2035	1380	368	351	59	105	103	120	34	17
Total	8534	5879	1779	1640	684	742	364	290	114	123
Accumulated 9:15 AM	2655		139	-	-58		72		-9	
9:15 AM to 11:15 AM										
At South Side	1015	907	240	255	120	153	39	37	12	10
At West Side	1605	1295	485	504	181	312	42	42	9	11
At North Side	1273	1319	601	585	316	302	56	43	17	17
At East Side	1355	1183	331	369	48	158	56	38	4	9
Total	5248	4704	1657	1713	655	925	193	160	42	47
Accum. at 11:15 AM	3199		83		-328		105		-14	
11:15 AM to 1:15 PM										
At South Side	1116	1334	264	248	129	116	74	78	10	12
At West Side	1539	1721	430	500	148	258	58	66	9	8
At North Side	1606	1493	502	484	247	236	117	98	14	20
At East Side	1427	1431	337	310	61	106	85	90	5	12
Total	5688	5979	1533	1542	585	716	334	332	38	52
Accum. at 1:15 PM	2908		74		-459		107		-28	
1:15 PM to 3:45 PM										
At South Side	1358	1380	397	457	98	42	47	53	14	10
At West Side	2304	1936	727	695	63	82	73	43	18	4
At North Side	2009	2072	950	923	126	57	79	79	26	18
At East Side	1733	1787	469	510	13	35	90	79	10	23
Total	7404	7175	2543	2585	300	216	289	254	68	55
Accum. at 3:45 PM	3137		32		-375		142		-15	
3:45 PM to 6:45 PM										
At South Side	1844	3076	424	430	58	52	150	204	1	5
At West Side	2750	3769	609	658	71	99	103	83	5	0
At North Side	3666	2564	778	844	119	103	162	228	23	3
At East Side	2330	3119	439	511	43	25	217	218	7	4
Total	10590	12528	2290	2443	291	279	632	733	36	12
Accum. at 6:45 PM	1199		-121		-363		41		9	
6:45 PM to 9:00 PM										
At South Side	1497	1225	110	89	8	10	46	54	0	0
At West Side	2224	1786	159	123	23	27	35	26	0	0
At North Side	2264	1847	174	176	32	19	43	60	0	0
At East Side	1522	1651	118	96	4	18	79	76	0	0
Total	7507	6509	561	484	67	74	203	220	0	0
Accum. at 9:00 PM	2197		-44		-370		24		9	

EXTRACT FROM CITY OF TORONTO ACT - Assented to April 1st,
1949. Session prorogued
April 8th, 1949

2.--(1) The Council of the Corporation may from time to time, as a preliminary step to the widening of a street or highway or any portion thereof when such street or highway has buildings thereon built out to the street line, pass a by-law or by-laws fixing as a building line the distance from the limit of the street (which distance shall not be more than twenty feet) at which any building to be thereafter erected abutting on such street or highway or portion thereof may be erected or placed, and for prohibiting the erection or placing of any such building, or portion of same, closer to the limit of the street than the distance fixed by the by-law.

Prescription of
street building
line

(2) A by-law passed under subsection 1 shall not take effect until it is approved by the Ontario Municipal Board and when so approved shall not be amended or repealed except with leave of the Board and on such terms as the Board may determine.

Approval of
Municipal
Board

(3) A by-law passed under subsection 1 shall not prevent the erection or placing closer to the line of the street than the distance fixed by the by-law of any one-storey shop or building front of such temporary character, conformable to the existing building by-laws and regulations, as may be reasonable.

Exception of
one-storey
shops

(4) After such a by-law has been passed and approved by the Ontario Municipal Board, it shall be the duty of the Corporation to acquire or expropriate the land on that side of the street or highway lying between the limit thereof and the building line fixed by the bylaw in any portion of such street or highway lying between two intersecting streets,-

Compulsory
street widening

- (a) when three-fourths of the land fronting and abutting on such portion has become occupied by buildings, other than one-storey shop or building fronts, built to conform to the building line fixed by the by-law;
- (b) at any time after the expiration of ten years from the date of the by-law upon petition in writing of the majority of the owners of property affected by the by-laws in any such portion.

(5) Where any owner of land clears that part thereof lying between the limit of the street or highway and the building line fixed by the by-law and offers to convey such part to the Corporation, the Corporation shall accept such conveyance and shall be liable for compensation to the owner or the persons entitled thereto to the same extent as if the by-law had been passed to widen the street or highway

Compensation
when land
cleared.

(6) In determining the compensation payable by the Corporation for the taking of lands for the widening of a portion of a street or highway in respect to which a building line has been fixed under this section, the Corporation shall not be liable to pay compensation for or in respect to any building erected in contravention of the by-law fixing the building line.

Limitation
of
Compensation.

(7) Notwithstanding anything to the contrary in any Act and except as provided in subsection 5, the Corporation shall not be liable to pay any compensation or damages by reason of having passed a by-law under subsection 1.

Exercise of
authority
not to give
rise to
claims.

STATUTES OF ONTARIO 1949, CHAPTER 137

ACT RESPECTING THE CITY OF ST. CATHARINES--Assented to
April 1, 1949:

Sect. 3. By-law Number 5331 to establish a parking meter fund set forth as Schedule C hereto is hereby validated and confirmed and declared to be legal and binding; upon the ratepayers of the Corporation.

SCHEDULE C

City of St. Catharines

Bylaw No. 5331

A Bylaw to establish a Parking Meter Fund

Whereas the Council of the Corporation of the City of St. Catharines deems it desirable that all profits from the use of parking meters in the City of St. Catharines should be used for the general betterment of conditions for users of motor vehicles.

Now therefore the Council of the Corporation of the City of St. Catharines enacts as follows:-

1. That all monies received from the use of parking meters including the Corporations' share of any fines recovered for violations or any offence in connection with the use of parking meters shall be deposited and form part of a special fund to be known as the Parking Meter Fund.

2. That out of such funds shall be paid the purchase price of any parking meters now used or hereafter acquired by the said corporation, and all expenses of maintaining the said meters including the salary of the Special Police Constable responsible for their maintenance, together with such other costs involved in the collection of parking meter fees and the operation of the said meters as may from time to time be approved by Council.

3. That all sums then remaining in the Parking Meter Fund shall be used only for the general improvement of traffic conditions and parking facilities including the purchase of any parking lot or lots in such manner as Council may from time to time decide.

4. That this by-law shall come into force as soon as it shall have been validated by an Act of the Legislature of the Province of Ontario.

PASSED this 13th day of December, A.D. 1948

Sgd: W. H. MacDonald
Mayor

Herbert H. Smith
Clerk

SCHEDULE XIII

144

Draft Legislation Validating Draft By-Law
Imposing Municipal License Fees on Motor
Vehicles subject to review by the City
Solicitor as to form.

DRAFT

An Act Respecting the City of Hamilton

Sect. X By-law Number 00000 to impose municipal
license fees on certain Motor Vehicles and to expend the
receipts wholly on the betterment of traffic conditions
within the City, as set out in Schedule 00 hereto is
hereby validated and confirmed, and notwithstanding any
act to the contrary, it shall be lawful for the Council
of the Corporation to impose, collect and expend the
aforesaid license fees as set out in the by-law in accor-
dance with the terms thereof.

Schedule 00

City of Hamilton

Bylaw No.00000

A Bylaw to provide for the registration and licens-
ing of Motor-Vehicles making day-to-day use of city
streets and pavements, and to charge fees therefor, and
to expend the proceeds of such fees wholly for better-
ments to streets and pavements and the general improve-
ment of traffic conditions within the City.

Whereas increase in the use of motor vehicles for
commercial purposes, personal convenience, and pleasure,
requires continuous increase in the number and width of
street pavements, the opening of new streets and highways
within the city, the earlier reconstruction of pavements,

and continuing increase in the cost of policing and control of traffic, of snow-removal, and pavement maintenance, and the Council of the Corporation deems it proper that the users of motor vehicles as such, should contribute directly to the cost of the works and services entailed for their safety, convenience and benefits.

Now therefor the Council of the Corporation of the City of Hamilton enacts as follows:

1. In respect of every motor vehicle

(a) domiciled in the City of Hamilton

(b) domiciled outside the City within five miles of the City boundary, when the vehicle is used in usual course in the day-to-day carrying on of business operations in Hamilton, or in conveying to and from their places of business or employment in Hamilton, the owner or other person or persons resident outside the City,

the owner shall register such motor vehicle with the City Treasurer, and shall pay an annual license or registration fee with respect thereto in accordance with the tariff set out in Schedule 'A' hereto.

2. Farmers and market gardeners selling the produce of their farms and gardens at retail in the market or from their vehicles in the streets shall not be deemed to be in business or employed in Hamilton for the purposes of Section I.

3. Payment of such license or registration fee shall be evidenced at all times during the currency of said license, by a decalcomania sticker supplied by the City at the time the fee is paid and affixed by the owner to the windshield of the vehicle, or by such other tag or other indication affixed to the vehicle as Council, with the approval of the Minister of Highways, may direct.

4. (a) All receipts from motor vehicle license fees, including therewith receipts to the City of fines imposed for non-payments or attempted

Schedule 'A' to the By-law

Identical with the tariff of fees current in
Chicago, appearing on Page 115 of the Report.

SCHEDULE XIV

N O R M A N D . W I L S O N
Consulting Engineer
City Planning - Urban Transportation
TORONTO

128 Glen Road,
October 18th, 1950.

Hugh J. Sedgwick, Esq.,
Chairman and Members,
Hamilton Planning Board,
City Hall,
Hamilton, Ontario.

Gentlemen: Mountain Access Roads included in
a Major Street Plan for Hamilton.

At the meeting of your Board on September 7th last, at which the members of the Mountain Access Committee were present, I described verbally and illustrated with lantern slides, the basic recommendations of Mr. Bunnell and myself for a Major Street System in Hamilton, including Access Roads to the Mountain.

As I stated at that time, it was our expectation that our final report would be submitted to you within a month from that date. Due to the coverage of our report, and as well the demands of other assignments, this has not been found possible, though little more than the final typing remains to be done.

However we realize the need of advising you now as to what we deem are immediate priorities, if any physical work is to get under way at any early date, or any legislation is to be applied for. This is the purpose of this letter, the contents of which have the full concurrence of Mr. Bunnell.

Physical Work Proposed

Improved access to the mountain is a matter of immediate concern to the citizens of Hamilton. Arkledun Avenue, which carries 60% of the traffic up and down the mountain is taxed to capacity. Further building develop-

ment on the mountain is certain. To meet the certain increase of traffic an added road up the mountain, designed to modern traffic standards should be constructed and put in service at the earliest date possible. This road is indeed made more urgent due to changes we recommend as necessary in Arkledun Avenue and Claremont Hill for the relief of those streets.

In our opinion the hairpin turn at Arkledun Avenue and Claremont Hill must be done away with, if free flow of traffic on either street is to be obtained. We also deem a road up the mountain from the head of Wentworth Street a necessary part of the major street plan, both to provide direct access to the mountain from the industrial zone, and to that extent remove through traffic from the central downtown. Our plan calls for Claremont Hill to be carried over Arkledun Avenue, and thence down the hill to a bridge to be constructed over the tracks at Wentworth Street.

This arrangement cannot be carried out until an entirely new road up the mountain can be provided, as it will entail the temporary closing of Claremont Hill. This last is a connecting link in King's Highway No. 6, and no road of acceptable grade now exists to which the heavy truck traffic using Claremont Hill can be reasonably diverted.

This is not the case with the Jolley Cut Road. Traffic using this road could be diverted without grave inconvenience to either Charlton Hill or Mountain Boulevard, and in lesser degree to James Street Mountain Road. Moreover, exact surveys and cross sections of the Jolley Cut Road on which to prepare estimates of cost are now available, and the lowering of the grade on this hill from the present maximum of 11-1/2% to a uniform 5% grade could be commenced immediately the money for same was voted.

Once the improved Jolley Cut was open for traffic, it is believed that the major part of the traffic using Claremont Hill would follow the new Jolley Cut road to avoid the hairpin turn, which would probably continue as existing until the new road was completed.

As regards this last, other than our studies to show the feasibility of this route, no surveys have been made to lay down the precise alignment, estimate the quantity of material to be moved, or determine exactly what extent of structures will be necessary. The making of these

engineering plans and estimates, with other preliminaries, will require at least six months before contracts could be let. The work itself would stretch over at least 18 months.

The road that we recommend be added at once to present facilities commences 150 feet south of Markland Avenue on James Street. The road rises on a 5% grade westerly along the mountain face, turning southerly into the Ontario Hospital ravine and quarry, and then easterly to debouch at West 5th Street opposite Brantdale Avenue. It is proposed to open a new street from Brantdale Avenue and West 2nd Street to connect with Queensdale Avenue at James Street. The cost of this new two-lane road which entails two sections of tunnel totalling 1750 feet would, we estimate, be of the order of \$2,500,000.

We recommend that funds be made available to make the necessary surveys to determine the definite location, design the necessary structures, and prepare estimates of cost in readiness to start construction at the earliest possible moment.

Also that similar surveys, plans and estimates be prepared for the proposed Claremont Hill-Wentworth Street connection, including plans for the Wentworth Street Bridge, and the betterment of Charlton Street between Ferguson Avenue and Wentworth Bridge. It is recommended that this work also be proceeded with as soon as possible so that only the over-crossing of Arkledun Avenue and the realignment of Claremont Hill at that point would require to be completed, when the new James Street Access Road was opened to traffic.

The completion of the above works with the later addition of a bridge over the tracks east of Ottawa Street, would essentially complete the program of Mountain Access Roads for ten or possibly fifteen years.

The James Street Access Road is proposed of two-lane width, it being an express highway throughout, free of all intersections and turnouts, and providing no frontage to private properties. The same applies to the Claremont Hill-Charlton Hill Road. Arkledun Avenue is a normal street with frontage on either side and four-lane width is proposed as minimum. While it is hoped that no frontage will be allowed on the Jolley Cut, it is proposed that this road from the end of Arkledun Avenue to where the road turns into the quarry (1200 feet in all) be graded of four-

lane width, though not immediately paved to such width. While not immediately proposed a grade separated branch-off from the Jolley Cut road to a portal at Wentworth and Concession Streets is always possible. When this additional expense is warranted, two additional lanes of pavement would be laid out from Arkledun Avenue to the quarry where the upbound (additional) lane would underpass the two central lanes, and with its corresponding downbound lane, enter tunnel under Alpine Avenue, to reach the surface at Wentworth Street.

The cost of the improvements proposed above, is of the order of:

for the Jolley Cut Road	\$ 500,000.
for the James St. Mountain Access Roadway	2,500,000.
for the Wentworth Street Bridge	500,000.
for the completion of Claremont-Charlton Hill	500,000.

Total of the order of \$4,000,000.

In our opinion, a tunnel leading directly from the lower level to the Mountain Top is neither warranted nor feasible at this time, in that it would serve relatively few and the cost would be in the order of \$7,000,000.

Furthermore, the works hereinafter recommended for immediate construction will always be necessary for adequate service to the presently built-up area on the Mountain Top.

Legislation

Our report will also recommend that the City of Hamilton apply for certain additional legislation at the next session of the Legislature, viz:

1. The right to establish a building line as a preliminary to widening a street, as was granted to the City of Toronto by Section 2 of the City of Toronto Act, assented to April 1, 1949. A copy of this section is attached. It is recommended that Hamilton ask for the identical legislation.

2. The right granted the City of St. Catharines in special legislation empowering it to earmark the net profits from parking meters for traffic betterments. This is Chapter 137 of the 1949 statutes, which by Section 2 confirms by-law 5331 of that city, "to establish a parking meter fund", "to be used only for the general improvement of traffic conditions and parking facilities including the purchase of any parking lot or lots in such manner as Council may from time to time decide". A copy of this legislation is also attached.

3. The right to impose municipal license fees on motor vehicles domicled within the municipality, or owned by any person residing within 5 miles of the city limits and carrying on business or employed in the City of Hamilton, when such motor vehicle is normally used within the city limits in the normal carrying on of such business, or normally used in going to or from such employment within the City of Hamilton. Provided that the sale of agricultural produce at retail by the growers thereof, within the city area, shall not be deemed to be carrying on business within the City.

The license fees proposed to be charged would be those currently charged by the City of Chicago. The imposition of municipal license fees, on vehicles not domiciled within the city, but regularly operating within the city limits, is that current in the cities in the States of Virginia, and specifically in the City of Richmond. Our report will develop this recommendation in fuller measure.

It is our considered opinion, drawn from many years' experience in dealing with street problems, that there is no practical solution to the modern traffic problem brought about by the use of the motor vehicle, or in fact any hope of reaching any adequate solution, except upon the single basis that the cost of providing the ever expanding special facilities demanded by the motor vehicle be largely paid for by the users of same.

Yours truly,

(signature)

Norman D. Wilson

NDW:M
Encl.

Hamilton, Ontario
October 24th, 1950.

Hugh J. Sedgwick, Esq.,
Chairman and Members,
Hamilton Planning Board,
City Hall,
Hamilton, Ontario.

Mountain Access Roads included in
A Major Street Plan for Hamilton.

Gentlemen:

We herewith confirm and amplify our answers given to enquiries made at the meeting with your Board this morning, in respect of our letter of the 18th inst.

1. Re Jolley Cut

Our estimate of \$500,000. for the Jolley Cut Improvement covers work starting immediately east of the Hairpin Turn on Arkledun Avenue. It includes re-grading the Jolley Cut road and its extension to Concession St. at Wellington St., thus permitting the reduction of its grade to an average of 5%. The amount mentioned provides for the paving to a two-lane width throughout and grading to a four-lane width from the Hairpin Turn to the level of the quarry.

To provide a four-lane pavement over this section and as well to improve Arkledun Avenue and John St. by widening existing pavements to four-lane width, with other related work, would cost an additional \$250,000.

We would point out that it would not be possible to complete this work on Arkledun Avenue in the immediate vicinity of the Hairpin Turn until detail engineering surveys are available to determine the alignment of the proposed Claremont Hill extension and design the proposed over-pass over Arkledun Avenue in order that the ultimate proposal of joining Claremont Hill with Charlton Hill and Wentworth Street should not be rendered unduly costly, if not impractical. We estimate that \$40,000. should be provided for these surveys and designs. This would make a total of \$790,000.

If this money were now made available, the Arkledun Avenue - Jolley Cut Improvement could be fully completed during 1951. Actual work on the Jolley Cut from the Hairpin Turn easterly could be started immediately.

2. Re Ottawa Street

With respect to the eastern outlet of Mountain Boulevard referred to in the fourth paragraph on page 3 of our letter, we explained this eastern outlet must be carried to Graham St., as due to the steepness of the hill it is physically impossible to make the descent to Ottawa Street and provide grade separation of the railway tracks.

The estimated cost of a bridge across the T.H. & B. Rly. tracks and the descent on structure to Graham St. will cost in the order of \$750,000. This includes the cost of widening Lawrence Avenue to provide at least 66 ft. width to the north of the bridge approach which will adjoin the railway right-of-way and occupy the south side of the existing road.

A second but separate project for the improvement of the east end of the Boulevard, is an underpass under the C.N.R. track which we estimate will cost in the order of \$125,000.

Before these latter works are undertaken surveys and engineering studies and design will have to be made and plans prepared for application to the Board of Transport Commissioners, etc., for which purpose an initial appropriation of \$60,000. should be made.

Yours very truly,

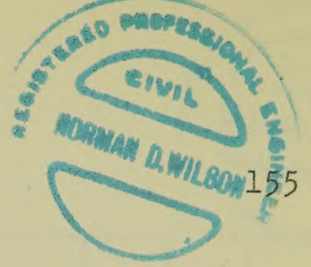
(initials)

~~S. D. Wilson~~
Norman D. Wilson

(initials)

~~A. E. K. Bunnell~~
A. E. K. Bunnell

SCHEDULE XVI



List of Plans

Deposited with

The Department of City Planning

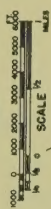
City of Hamilton

1. Centre Section, Midtown Expressway Project
via York, Vine, Gore and Wilson Streets and
co-related Street Improvements.
2. Studies of Sections, Development of Express
Highways over Long Term.
3. Sketch indicating Arrangements in Proposed Con-
nections of Claremont Hill to Charlton and
Wentworth Streets, Walnut Street to Mountain
Boulevard, and Arkledun Avenue to Concession
Street; and Proposed Young Street Extension
to Cumberland Avenue.
4. Study for Mountain Access Road, James Street to
Queensdale Avenue. Five per cent. gradient.
5. Sketch Plan of Proposed Eastern Outlet for the
Mountain Boulevard.
6. Study for Mountain Access Road, Dundurn Street
to Fennel Avenue. Four and one half per
cent. gradient.

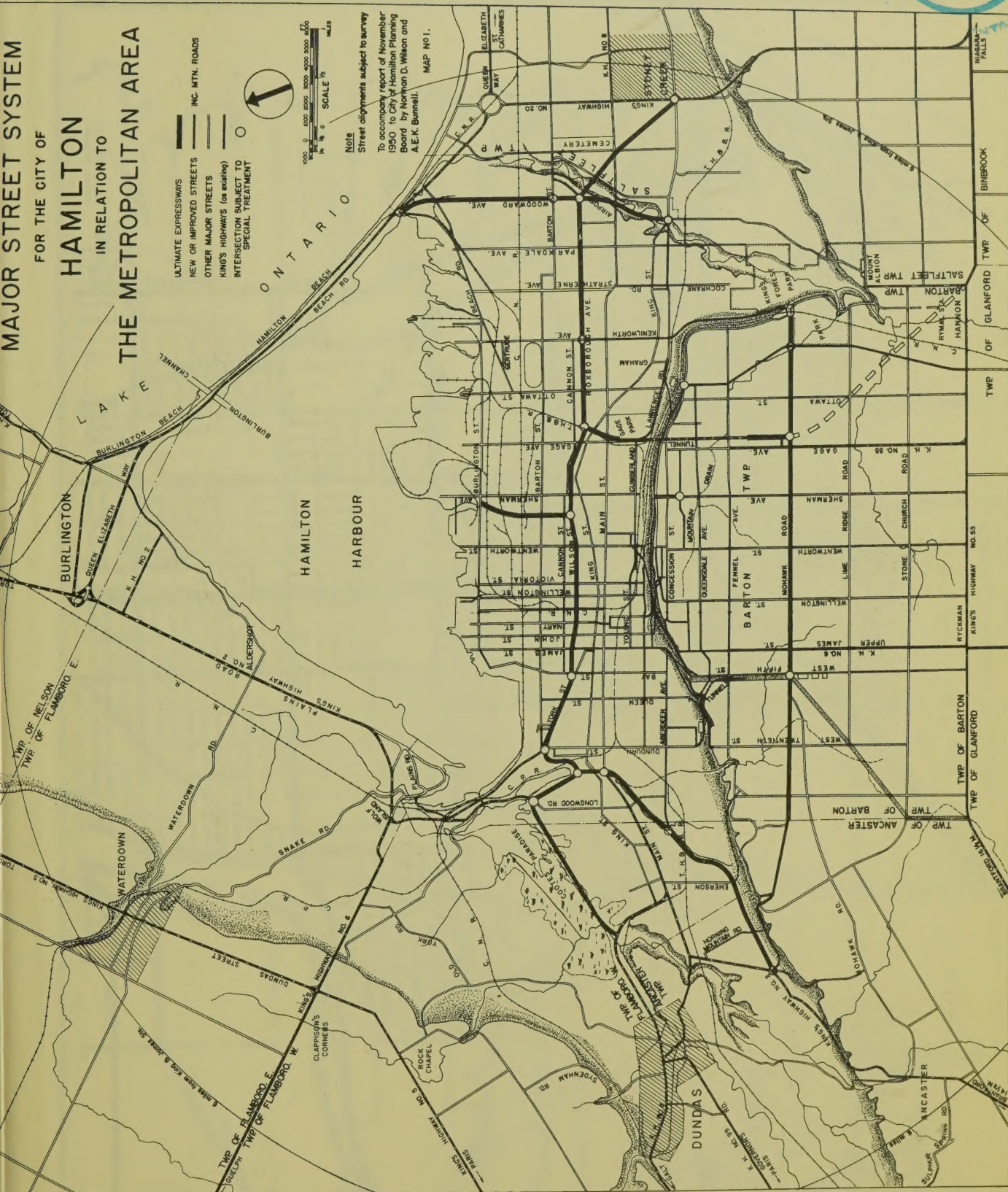
-X-X-X-X-X-

MAJOR STREET SYSTEM FOR THE CITY OF HAMILTON IN RELATION TO THE METROPOLITAN AREA

- ULTIMATE EXPRESSWAYS
- NEW OR IMPROVED STREETS
- OTHER MAJOR STREETS
- KING'S HIGHWAYS (as existing)
- INTERSECTION SUBJECT TO SPECIAL TREATMENT



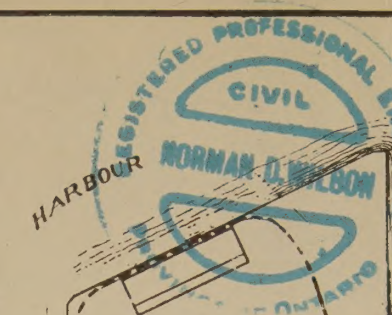
Note
Street alignments subject to survey
To accompany report of November
1950 to City of Hamilton Planning
Board by Norman D. Wilson and
A.E.K. Bunnell.
MAP NO. 1.



REGISTERED PROFESSIONAL
CIVIL
NORMAN D. WILSON

MAP OF CITY OF HAMILTON ONTARIO

W.L.M. FAUL BAS. CITY ENGINEER
CITY ENGINEER'S OFFICE 1943.
SCALE, 800 FEET TO AN INCH

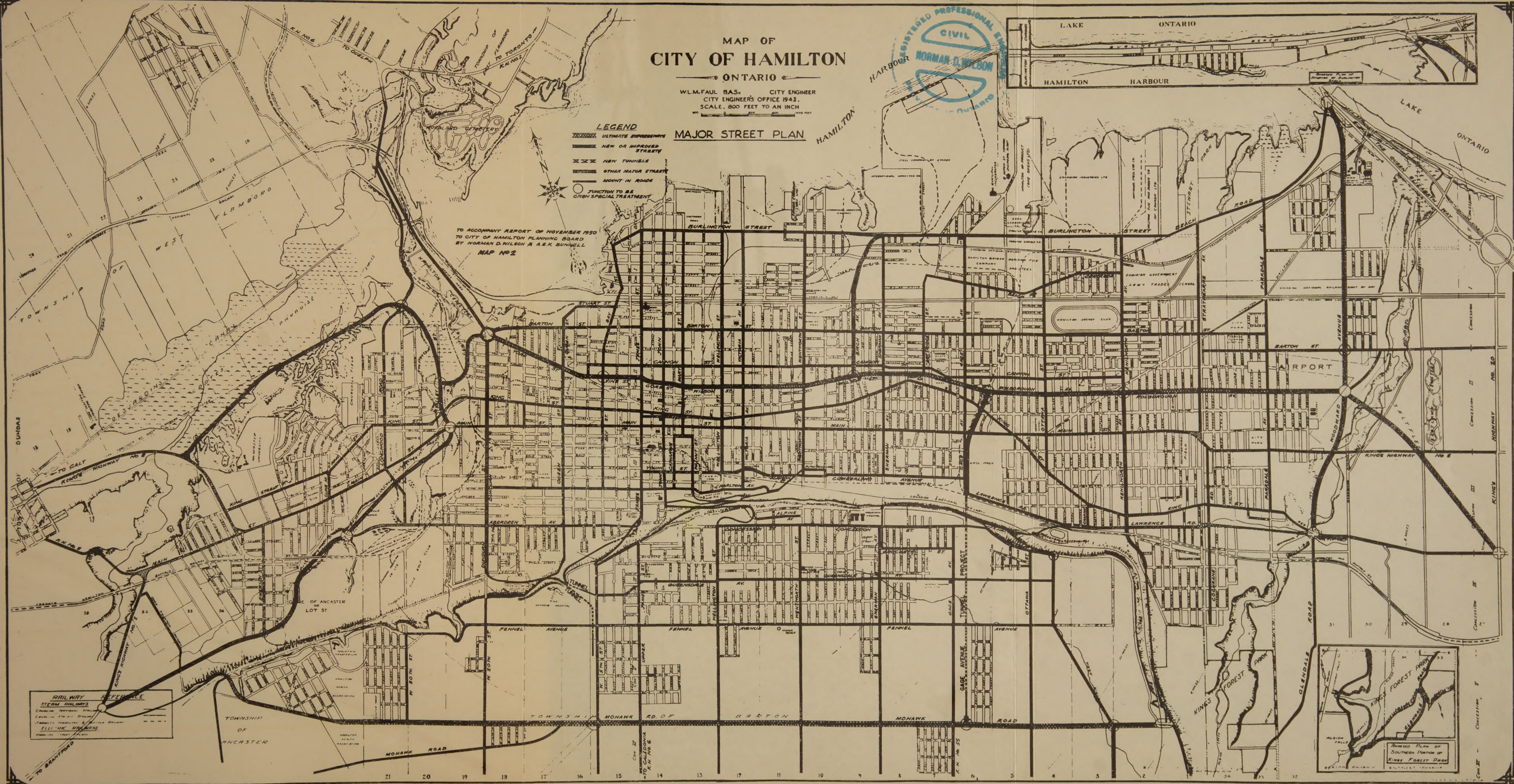
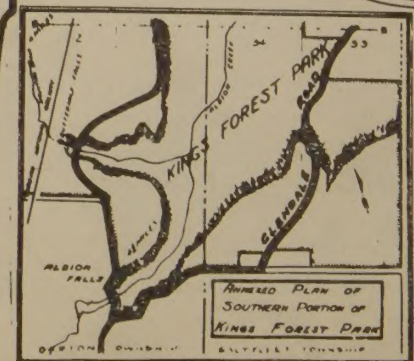


- LEGEND**
- ULTIMATE IMPROVEMENTS
 - NEW OR IMPROVED STREET
 - NEW TUNNELS
 - OTHER MAJOR STREET
 - ADJUST IN ROAD
 - JUNCTION TO BE GIVEN SPECIAL TREATMENT

MAJOR STREET PLAN

TO ACCOMPANY REPORT OF NOVEMBER 1950
TO CITY OF HAMILTON PLANNING BOARD
BY NORMAN D. WILSON & A.E.K. SUNNELL
MAP NO. 2

RAILWAY REFERENCE
STRAIGHT RAILWAYS
CANADIAN NATIONAL RAILWAY
GOVERNMENT OF CANADA
TOWN OF HAMILTON & DISTRICT
ELECTRIC RAILWAYS
HAMILTON STREET RAILWAY



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